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# Saving Salmon the American Indian Way

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## To the READER

“Saving Salmon the American Indian Way” challenges a popular romantic myth—the idea that Native Americans had little regard for property rights. In fact, tribes in the coastal regions of northwestern United States and southwestern Canada had a sustainable system of salmon fishing based on property rights to fishing sites. This paper discusses this system, which teaches valuable lessons about how to improve today’s management of salmon in the Pacific Northwest.

The author is Manuel Nickel-Zueger, who wrote it while he was a research associate with PERC. Also while at PERC, he coauthored with Jane S. Shaw a book on energy, to be published in 2004 in the Greenhaven Press series, “Critical Thinking about Environmental Issues.” A graduate of the University of Arizona, Nickel-Zueger spent a summer fishing and processing salmon commercially.

This essay is part of the *PERC Policy Series*, which includes short, readable papers on environmental topics. The papers are edited by Jane S. Shaw and produced by Dianna Rienhart. Mandy-Scott Bachelier is in charge of design. This and other papers in the series are available from PERC on its Web site, [www.perc.org](http://www.perc.org).

“Property rights were an integral part of  
American Indians’ heritage.  
—Terry L. Anderson (1996, 20)

# **Saving Salmon the American Indian Way**

MANUEL NIKEL-ZUEGER

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## **INTRODUCTION**

Once the basis of tremendous wealth, Pacific salmon fisheries are in trouble.<sup>1</sup> Fishermen off the coasts of Washington, Oregon, and northern California have had to cope with drastic reductions in harvests over the last decade. Their counterparts off Alaska sometimes produce salmon of poor quality while facing stiff competition from farmed salmon. The command-and-control approach to salmon management has failed to promote thriving fisheries.

Fortunately, a better way of managing salmon fishing is available if we heed the lessons from the early Native Ameri-

can system. A popular notion exists that American Indian societies held material wealth in low regard and that property rights were nonexistent. The facts, however, refute this romantic myth. Many Native American salmon fisheries in the Pacific Northwest were based on a sound system of property rights. Moreover, these rights supported a system of cost-effective and sustainable fishing.

These property rights were eventually abolished by political and legal decisions that followed the arrival of white settlers. Although some of the newcomers attempted to retain rights to fishing sites, their efforts, too, were ultimately undermined by the state. By the mid-1930s, the once-thriving fisheries shed the last vestiges of site ownership. The fisheries became a government-regulated commons, plagued by excessive fishing effort and often excessive harvests, a situation Robert Higgs (1982, 55) describes as “legally induced technical regress.”

This paper discusses the nature of American Indian property rights in these salmon fisheries, the decline in property rights protection following white settlement, and the disturbing status of salmon fishing today, in which government regulators attempt to avoid the “tragedy of the commons” but promote a destructive race for fish.<sup>2</sup> Although it is neither realistic nor desirable—for reasons that will be discussed in this paper—to return to the same property rights regime that Native Americans employed, some form of property rights should be adopted to promote healthy salmon fisheries in the Pacific Northwest today.

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### WHY PROPERTY RIGHTS?

To understand salmon fisheries before white settlement in the Pacific Northwest, it is necessary to understand the benefits of private property rights and the conditions under which property rights emerge. Well-defined property rights en-

courage stewardship and optimal use of resources (see Anderson and Leal 2001). First, they enable the right holder to capture any value that comes from investing in or protecting the owned resource and they force the holder to bear the costs of poor decisions—often decisions that lower the value of the resource. Hence, there are powerful incentives for efficient resource use with property rights. As Gary Libecap (1989, 1) sums up the lesson, property rights “critically affect decision making regarding resource use and, hence, affect economic behavior and performance.”

A property rights framework is generally contrasted with a commons framework in which there is no single owner who bears the full costs and benefits of resource extraction or conservation. When use is open to everyone or not effectively constrained by communal or state rules, a “tragedy of the commons” can result.<sup>3</sup>

The fishery provides a classic situation for such a tragedy. In a fishery, fishermen do not own fish unless they are caught. Each fisherman receives the full benefits of catching more fish, but does not have to bear all the costs of depleting the resource—this cost is divided among all the fishermen. This discrepancy between full benefits and fractional costs leads fishermen toward catching too many fish, often to the point of risking severe stock depletion. Even if a fisherman attempts to conserve, any fish that he or she does not capture is available to others for harvest. Daniel Huppert and Gunnar Knapp (2001, 79) explain that “without individual property rights to the fish or collective fishing rules, each has little or no individual economic incentive to sacrifice current catch for long-term future harvests.”

The perils of the open-access commons in terms of fewer fish and smaller fish become evident over time, but defining and enforcing property rights are costly, so replacement of the commons with private property rights is not inevitable. And in some cases, established property rights in the resource can be usurped by a higher authority. This occurred in the salmon fisheries of the Pacific Northwest.

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## PACIFIC NORTHWEST INDIAN PROPERTY RIGHTS

The history of Pacific Northwest salmon fisheries supports the view that private property rights were an important factor in maintaining an abundance of salmon. Notably, American Indians in the Pacific Northwest held property rights to a variety of natural resources and other assets along the coastal areas. These rights were clearly established and generally respected in the region. Some were held by individuals, some by families or clans, and some by tribes.

Franz Boas, a German ethnographer who began studying the Indian tribes of the Pacific Northwest coast in 1885, remains one of the premier authorities. He intensively studied the Kwakiutl, whose traditional home is in present-day British Columbia. Boas (1966, 35–36) describes a broad range of property rights held by the Kwakiutl, reporting, for example, that hunters could not seek game on the hunting grounds of other clan leaders (*numayms*). Boas also cited berry picking grounds, rivers used for catching salmon, and traps used for fishing as exclusive property.<sup>4</sup> Viola Garfield (1945, 628), another authority on Pacific Northwest Indians, particularly the Tsimshian, found that “individual or lineage property rights to areas frequented by mountain goats seem everywhere to have been recognized, probably because of the value placed on the fine, silky goat-hair for blanket making.”

Pacific Northwest Indians also owned canoes, spears, other fishing equipment, and personal valuables. Some property was owned by households (Goddard 1934, 26),<sup>5</sup> and homes were considered familial property (Garfield 1939, 275). Slaves, too, were private property (Garfield 1939, 628; Goddard 1934, 87). Property rights permeated all levels of Pacific Northwest Indian culture.<sup>6</sup>

These rights included rights to salmon fishing areas. “The *numayms* of all the tribes also all own rivers. They do not allow the men of other *numayms* to come and use their river to catch salmon,” wrote Boas (1966, 36). Boas was describing the Kwakiutl



Indians, but Garfield (1945, 627) found the same to be true for other tribes: “Salmon was the staple food of the Tlingit and Haida as of most coastal peoples, and salmon streams were valuable property. Large quantities of dried salmon were also needed for potlatches and other festive occasions. The evidence clearly shows that every salmon stream was claimed by private owners.” (The ethnographers do not tell us how many fishing areas were owned on a single river.)

Ownership of fishing sites meant more than merely the right to fish in that place. Robert Higgs (1982, 60) explains that “what the Indians owned was *not* simply a claim on certain quantities of fish. Rather, the Indians’ property rights ensured them the opportunity to take the salmon normally returning—that is, returning without human interception.” Other people could not rob the fish by catching them before they arrived at established fishing sites.

Salmon stocks were the primary food for Pacific Northwest Indians, and the population density of Indians in the Pacific Northwest was high compared to other parts of North America (Codere 1950, 50, 125; Suttles 1987, 46). Given these facts and the Indians’ sophisticated fishing gear, which enhanced their ability to catch salmon, salmon depletion might have occurred even before contact with Europeans, had salmon not been protected by private property rights. The value of salmon gave Indians strong incentives to define and enforce property rights to productive fishing areas.

## ENFORCEMENT OF PROPERTY RIGHTS

Ownership was enforced by physical force and ostracism. Boas (1966, 35) reported that hunting on another person’s hunting ground usually led to a fight, “and generally one or both are killed.” Also, when Indians were caught fishing on streams that they did not own, and “a man disobeys and continues to catch salmon, they fight and often both, or sometimes one of them, is

dead” (Boas 1966, 36). Theft of personal property could often lead to death, too. An Indian who tried to build a fish trap on a site that was already owned was likely to be killed (Boas 1966, 36).

Just as individuals could threaten combat to protect their property rights, so, too, the threat of war could be used to defend—or take—property rights. The evidence differs, however, on how widely tribal wars reflected battles over property rights (Codere 1950, 105). Wars were often stimulated by other events, such as humiliation of a tribal member.

### THE POTLATCH

Indians used their cultural institutions to enforce property rights. As contact with whites intensified in the eighteenth century, trade led to greater wealth, a decline in warfare, and a rise in the importance of the potlatch. The potlatch, a cultural ceremony typical of most Pacific Northwestern Indian tribes, increasingly replaced warfare as a mechanism to carry on tribal rivalries and to claim and enforce property rights.<sup>7</sup>

The potlatch was an intricately detailed ceremony and an important political institution for many Pacific Northwest Indian tribes. H. G. Barnett, an anthropologist who studied the potlatch, explains that “[i]n its formal aspects the potlatch is a congregation of people, ceremoniously and often individually invited to witness a demonstration of family prerogative” (Barnett 1938, 349-350). Usually, the chief represented his kinship group or clan by organizing and hosting the potlatch, although all members played a role.

The potlatch is commonly misrepresented as a gift-giving and property-redistributing ceremony, “but the underlying principle is that of the interest-bearing investment of property,” wrote Boas (1966, 77). In other words, the gifts the chief presented at the potlatch created obligations from the invited chief. The recipient not only owed the return of the gifts at some time in the future, but he had to come up with additional gifts as “interest.”

Sometimes debts were not repaid. Garfield (1939, 274) says of the Tshimshian, “The more usual way of collecting a debt was to ridicule the debtor at a potlatch or to seize property belonging to him or his lineage. Thus there are accounts of seizure of land rights, names and privileges to settle unpaid debts. Capture of a member of the offending lineage was also resorted to.”<sup>8</sup>

The potlatch was used to clarify property rights. It provided a setting at which claims to rights were recorded orally. Clearly defining rights at large gatherings made it easier to enforce the rights because the owners could be confident that others were aware of the rights and understood the consequences of trespassing. Economist D. Bruce Johnsen (1986, 41) says that the Southern Kwakiutl Indians “used the potlatch system to maintain exclusive property rights in their most important capital asset and main source of wealth, the salmon fishery.”

## SALMON FISHING SITES

Families and individuals who had exclusive rights to certain fishing sites had an incentive to invest time and resources to make the sites as productive as possible. Indians developed impressive weirs, nets, traps, spears, and other technologies to catch salmon. Weirs are fences built in rivers and streams that funnel salmon into traps where they can be easily harvested (Stewart 1977, 99). Boas (1966, 34) recounts that the Kwakiutl even built dams “for the purposes of the fishery.”

Pacific Northwest coastal tribes spent most of their time during the annual salmon runs fishing and preserving fish for the winter, which would be used for their own food, for trade, and for potlatches and other ceremonies. As Philip Drucker (1965, 13) notes, it was not only the abundance of salmon that made it so useful, but also how easily it could be preserved: “The flesh, flensed thin, could be smoke-dried to last for a considerable time, despite the humid climate.”

As salmon runs occur during limited seasons, preservation made salmon a valuable source of food for much of the year. It could then be traded to inland Indian tribes. In the Pacific Northwest, high humidity and rainy weather made the season for drying salmon short. As long as property rights were respected, the Indians could minimize costly precautions against attacks while salmon was being preserved. They could spend more time creating wealth rather than defending their right to create it.

Because clear and enforceable property rights reduce conflict, trade flourished between the coastal tribes and the inland tribes and clans. Coastal groups had an abundance of salmon and other seafood to offer. From the inland tribes they sought “dressed deer and moose hides, ermine pelts, tailored skin clothing, coppers, and possibly jadeite [jade] for celt [ax] blades” from interior tribes (Drucker 1965, 110).

Much of this trading occurred at the Dalles, a geologic formation in the Columbia river that creates steep rapids. The Dalles was a fisherman’s dream. As large schools of salmon worked their way upriver through the rapids at the Dalles, they were forced to rest in calm pools before continuing, becoming easy to catch. This made the Dalles highly desirable—and privately owned. Rights to this section of the Columbia River valley were held by Chinookan-speaking groups. The place was so well known that tribes “flocked to the Dalles to trade for dried salmon,” Philip Drucker (1965, 169) wrote. “Others with adequate fishing grounds of their own came to trade for other products,” making the Dalles a marketplace for diverse goods. Some Indians came from as far as the Great Plains and the Rocky Mountains (Netboy 1958, 13).

Salmon was not the only resource that was traded. Eulachon oil, a precious oil from the eulachon or candlefish, was eaten, traded, and used for rivalries in potlatches.<sup>9</sup> It served as a dip and a sauce for fish, berries, and smoked meats. “Long trails, known as ‘grease trails,’ led into the interior, where the coast people traded with the Athaspascan-speaking tribes,” writes Pliny

Earle Goddard. “The oil was carried by canoe and also traded among the Northwest Coast people” (Goddard 1934, 69; see also Drucker 1955, 24).

Pacific Northwest Indians capitalized on many potential sources of wealth in the rivers and streams. Herring, smelt, flounder, halibut, cod, trout, and several other types of fish were caught by Indians, often depending on how plentiful the various species were at given sites. Indians even created attractive spawning sites for herring so that they could harvest the roe easily (Stewart 1977, 21, 124–27). Shellfish were also harvested and could be smoked and cured like other fish (Goddard 1934, 73–74). The added benefit of using other resources obtained from rivers and streams with little additional cost contributed to the value of rights to fishing sites and therefore to the benefits of enforcing those rights. Enforcement could occur through the potlatch or, if necessary, other means.

Exclusive property rights to fishing streams also allowed the Indians to be “farmers of fish,” as D. Bruce Johnsen (2002, 3) puts it. Johnsen presents the hypothesis that the Indians actually increased the size of the salmon that returned to the streams over time. He believes that this happened because the Indians were able to select salmon “in favor of larger fish, larger population size, reduced population variability, advantageous run timing, and greater home-stream loyalty” (Johnsen 1999, 7). Johnsen’s argument suggests that the Indians may have consistently caught and eaten the smaller fish, allowing primarily the larger ones to reproduce. Johnsen argues that the property rights framework encouraged such salmon husbandry among Indian tribes. He notes that:

exclusive tribal ownership of salmon streams served two important functions characteristic of settled agriculture. First, it ensured the capturability of returns from the tribal leader’s husbandry investments. Second, it clarified the information feedback mechanism from trial-and-error husbandry experi-

ments, thereby encouraging entrepreneurship and the purposeful accumulation of stream-specific knowledge by the tribal leader. (Johnsen 1999, 7)

For such extensive salmon husbandry to occur, property rights must be exclusive and secure.

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### THE HUME CASE

After whites settled the Pacific Northwest, they established dominance over the fisheries. Over time, the property rights framework that had been established by Indians was whittled away. Through their legal and political institutions, the white settlers changed the rules. Looking back, however, we see that some settlers clearly understood the legacy of the fisheries that the Indians created. One of those settlers was R. D. Hume.

Hume was a salmon fisherman and canner on the Columbia River. According to one account, he “had the foresight and the business prudence to realize the effects of competition and over-fishing were as injurious to profits as they were to salmon runs” (Labbe 1995, 12). In a commons with open access, competition can lead to depletion.

As a result, Hume moved his operation and cannery to the Rogue River in southwest Oregon, where he tried to protect it from the tragedy of the commons. Hume clearly understood property rights. He “purchased all the tidelands in the estuary, and quickly established a monopoly over all the salmon fishing on the Rogue,” writes fisheries biologist Jim Lichatowich (1999, 91). In this way he could effectively control the fishery, and his decisions would directly enhance or destroy his fishery. Thus, he was a leader of efforts to have fish ladders built on the dams that often blocked migration in the Rogue River (Lichatowich 1999, 77). As late as 1908, Hume had the “only private commercial

salmon fishery of its kind on the Pacific coast,” according to Jim Labbe. “Significantly, the fishery did not experience the catastrophic declines in harvest levels seen on the Columbia and Sacramento rivers in the late nineteenth century” (Labbe 1995, 3).

Hume’s control of the fishery would not last. In *R.D. Hume v. Rogue River Packing* (1907), the Oregon Supreme Court ruled that Hume could not deny fishing access to others on the Rogue, even though he owned the tidelands. With this decision, Hume lost his ability to prevent trespass, his right to a private fishery, and his exclusive right to fish. Though Hume planned to take his case to the U.S. Supreme Court, his death ended his legal battle (Labbe 1995, 21–22).

As a result of the court decision, access to the Rogue by other commercial fishermen could no longer be denied. The abundance of salmon that had been protected by Hume’s zealous protection of private rights attracted crowds of fishermen, and the tragedy of the commons followed. The April 18, 1916, issue of *The Gold Beach Globe* noted: “The banks of the Rogue River had the appearance of an army encampment Friday night, with the nets substituted for guns. Every point of fire is upon it, with its accompanying group of fishermen waiting for midnight” when fishing would begin (quoted in Labbe 1995, 25).

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## THE RIGHTS CRUMBLE

White settlement in the Pacific Northwest completely changed Native American institutions. Over time, increasing immigration led to efforts to move the Indians away from prime lands that the settlers wanted. And even where whites such as R. D. Hume obtained property rights to salmon sites similar to those held by the Indians, the rights did not last for long.

The general property rights framework shared by the Pacific Northwest Indians had allowed salmon stocks to thrive. At the

same time, however, the framework was incomplete. Property rights existed to sites as well as fishing gear but not to fish. This left open the option of establishing new sites and even a mobile fishery in order to meet the growing demand for salmon. As human population grew in the area, markets for salmon expanded, and new technologies for ocean fishing and salmon processing developed, fishermen did move to the ocean. Over time, the tragedy of the commons resulted.

The initial result of white settlement, however, was trade, which was beneficial for Indians and whites. The fur trade was the first major example, spurring much of the original migration to the region (Lichatowich 1999, 81).

As white settlement continued and population pressure increased, the Indians' property rights structure and their fisheries began to crumble. In 1854, Governor Isaac Stevens of the Oregon Territory (modern-day Washington and Oregon) negotiated treaties with Indian tribes over land rights, resulting in what are known as the Stevens' treaties. In exchange for giving up large areas of land, Indian tribes were guaranteed "the right of taking fish, at all usual and accustomed grounds and stations . . . in common with all citizens of the Territory" and were given some monetary compensation. The tribes recognized that these treaties opened their off-reservation fishing sites to others, says Mariel Combs (1999, 687), "but there is no evidence that they considered this a significant limitation."<sup>10</sup> At the time, the salmon were plentiful.

Technology changed this balance of interests. In the 1860s, a new method for processing salmon—canning—expanded the market for salmon. Before that, says Lichatowich (1999, 84), markets for salmon were limited by the uneven quality and mediocre taste of salmon that had been salted or smoked and shipped long distances. Canning, which required boiling the fish, made the quality more reliable, increasing salmon's value in distant markets. This led to more fishing, as people scrambled to capture a slice of the profits that salmon could provide.



Immigration coupled with a developing economy and expanding markets for salmon exerted pressure on traditional Indian fisheries. The initial approach to negotiating with the Indians of the Pacific Northwest was much as it had been elsewhere, to try to move them to reservations, away from salmon sites. Lichatowich writes that the “real objective was to get the Indians out of the way of the white settlers, who believed they could make better and more productive use of the natural resources of the Northwest” (Lichatowich 1999, 99).

Although the Stevens’ treaties recognized the Indians’ right of access to traditional fishing sites, settlers claimed their own private land, on which traditional fishing sites were sometimes found. These claims created a conflict between Indians and whites, as many Indians “were confronted with fences and KEEP OUT signs” (Lichatowich 1999, 99). In general, says Lichatowich, the higher courts recognized the rights of Indians to fish, but “the lower courts and local government agencies made it clear that the native fishermen could harvest salmon only according to the terms dictated by the new culture” (Lichatowich 1999, 99). The ensuing legal history was one between states, which attempted to deprive the Indians of the rights established under the Stevens’ treaties, and the federal government, which tried to uphold those rights.

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### LEGAL CONFLICTS BEGIN

Conflict between the states and the federal courts over Indian rights began in 1887, when the United States, as the trustee for the Yakama Indians, took a case on their behalf. In *U.S. v. Taylor*, the court ordered Taylor to allow Indians access to the Yakama’s historic fishing grounds on the Columbia River. Taylor, a farmer, fenced his land to prevent his crops from being trampled during the fishing season.

But the conflict deepened. In 1895, the Washington state gov-

ernment passed legislation that allowed tidelands to be purchased by private owners. Many of these tidelands were traditional Indian fishing sites. Later, the state essentially challenged the Court's 1877 ruling by issuing a license to the Winans Brothers to operate a fish wheel and exclude Indians. (A fish wheel scoops fish out of the water and drops them in a chute.) In the 1905 case *U.S. v. Winans*, however, the federal court ruled that even though the Winans could use fish wheels, they did not have the right to exclude Indians from the Winans' Columbia River site because it was a traditional fishing site of Indians (Combs 1999, 690).

A 1919 case, *Seufert Bros. v. U.S.*, expanded the *U.S. v. Winans* ruling, requiring whites to grant greater access to Indians. The Court "declined to interpret the [Stevens] treaty language as limiting access to only those 'usual and accustomed' fishing grounds expressly mentioned in the treaties," writes Combs (1999, 690). Litigation continued in this vein, as the state and federal courts argued over access to the fishery and regulatory control, with the general result that Indians could not exclude whites (except on reservations), and whites could not exclude Indians.

In 1969, the *Sohappy v. Smith* decision further expanded the meaning of the original Stevens' treaties. The court held that not only did Indians have the right to fish at their traditional sites, but they were entitled to "an opportunity to take . . . a fair and equitable share" (*Sohappy v. Smith* 1969, 907). In *U.S. v. Washington* (1974, 343), Judge George H. Boldt expanded the meaning of fair share to include "the opportunity to take up to 50% of the harvestable number of fish that may be taken." Indians went from being exclusive owners of fishing sites to retaining the right to fish at traditional sites and later to obtaining an equal share of salmon.

By the time of this decision in 1974, however, the fisheries had already become a classic example of the tragedy of the commons. Although Indians could take half the amount of salmon that could be caught, Indians and whites in Washington and Oregon

were faced with a depleted fishery because of its history of open access. Lichatowich claims that before white settlement, the Yakama Indians caught 160,000 of the 500,000 salmon that ran in Washington's Yakima River each year. By 1900, only 20,000 of 50,000 were caught. The catch continued to decline, and by the 1930s the Yakama only harvested between 1,000 and 1,500 fish (Lichatowich 1999, 100). Indians had lost a considerable amount of wealth, and so had whites, as the run strength was rapidly depleted by the open-access fishery.

## THE LAST RIGHTS—INITIATIVE NO. 77

Under control of whites, the fisheries in the Pacific Northwest had become open-access commons. The traditional Indian rights and societal norms that prevented interception of fish stocks were disregarded. Mobile fishing, including ocean fishing, was legal and, with technological improvements such as gasoline engines, increasingly effective. In addition, salmon fishermen from as far away as Russia and Japan caught fish that had been spawned in the rivers and streams of the Pacific Northwest. As the plight of the Washington and Oregon fisheries worsened, the remaining fixed-gear fishing sites were increasingly criticized because they worked too well. By 1926, traps, weirs, and fishing wheels were banned in Oregon (Higgs 1982, 67–68). Soon after, they were targeted in Washington. The story is well described and documented by Robert Higgs (1982, 73–80).

The salmon fishery in Washington had too many fishermen and too much gear, both fixed and mobile. Everyone was aware that it was overfished, but there was no easy solution. Making matters worse, the 1930s was a time of economic depression and high unemployment. All fishermen perceived fishing as a right and blamed other fishermen for the fishery's declining productivity. Violence sometimes ensued. Gillnetters (fishermen who use large nets placed vertically in the water) were especially opposed

to trappers and owners of fish wheels, who caught fish easily and, in the gillnetters' view, let too few salmon escape into the river system. The gillnetters' job was more difficult, and (Higgs points out) a particularly dangerous one before the adoption of the gasoline engine. Fixed-gear operators became scapegoats, even though they had clearly defined rights to fishing sites and had established themselves before gillnetters.

Gillnetters, purse seiners (fishermen who also use large nets), and a growing group of sports fishermen sought to outlaw fixed gear in rivers. They argued that this would curtail overfishing and, by putting the low-cost harvester out of business, would raise the price of salmon. This thinking was fundamentally flawed. Even if certain types of fishing methods were prohibited, the race for the fish would continue because the remaining fishermen would compete to out-fish their counterparts. This is typical when fishing rights are in a commons (Leal 2004).

In 1934, a voters' initiative to ban all fixed-gear equipment was approved in Washington by a vote of almost two to one. Passage of Initiative No. 77 marked the complete abandonment of property rights to commercial fishing sites in the Washington fishery (Higgs 1982, 80).

Whether they realized the implications or not (and it is unlikely that they did), the voters made it clear that they preferred an open-access fishery to a fishery with private site rights. They decided that property rights had no place in fishing. In the spirit of the 1930s, regulation was the perceived answer to both the nation's woes and the fishery's.

The capital losses from banning fixed-gear sites were tremendous. Estimating the Washington losses conservatively and in 1933 prices, Higgs quotes a lower-bound estimate of \$2,272,372 for the loss of fixed-gear sites and the outlawed gear (Higgs 1982, 80). He contends that the social loss was higher, because it made permanent an inefficient fishing regime, paving the way for continued future loss.

## THE REGULATORY REGIME

The passage of Initiative No. 77 in Washington and similar measures in other states marked the end of most, if not all, private site rights. The woes of the salmon fishery, however, had been manifest long before site rights were banned, and as early as the 1870s the territorial legislatures in Washington and Oregon fisheries had begun to regulate the fisheries.

The first measures were those frequently used by governments, often to little or short-lived avail: regulation of the fishing season and regulation of fishing gear. Operators of fixed gear were targeted, says Higgs (1982, 65–66), even though they “constituted a small minority of the total fishing labor force.” These operators had to pay license fees. Only later were fees applied to mobile gear operators, and their fee was lower, regardless of where they fished. Once fixed gear was prohibited in Oregon in 1926 and Washington in 1934, the regulators went after mobile gear operators, as the underlying problem of overfishing remained unsolved.

The principal problem with most regulatory systems is that they fail to recognize that humans are entrepreneurial. If there is a legal way to get around the rules, and if there is a benefit to doing so, they will try. For example, if the fishing season is shortened, fishermen will invest in equipment such as faster boats and more expensive gear for finding fish. This exacerbates the “race to fish” and leads to catching the same number of fish in the shorter time span. “Not only do the stocks decline, but also fishing becomes wastefully expensive,” writes Leal (2002, 3).

Today, in the Pacific Northwest, regulations limiting the number of fish that can be caught now largely prevent serious overfishing of salmon, but the process remains expensive and inefficient.<sup>11</sup> Overfishing has largely been transformed into a problem of overcapitalization and a race for salmon, which ultimately decreases both the quality of salmon and the return from fishing.

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## THE MODERN FISHERY: NEW DEMANDS

Government regulation continues to have serious drawbacks. But what should replace it? Some experts like Higgs rightly lament the abrogation of property rights in the fisheries of the Pacific Northwest. The rights that existed then, however, would not be sufficient to address today's demand for salmon.

When canning was the main salmon processing method, the quality and freshness of the fish were not extremely important, because the boiling required for conventional canning assured safety and changed the taste of the fish.<sup>12</sup> But canning is less dominant today. By the mid-1980s, for example, only about 30 percent of Alaskan salmon was canned, compared with more than 70 percent in the early 1970s (Anderson 1997, 177). Today, demand for salmon extends well beyond canned salmon to include wild salmon, farmed salmon, salmon roe, and smoked salmon, and quality has become much more important.<sup>13</sup>

Fresh wild salmon is a delicacy. The fats and oils that wild salmon metabolize give salmon caught in saltwater its distinctive taste, but the quality of salmon flesh deteriorates when salmon are in fresh water (see Groot and Margolis 1991). Catching salmon in salt water—inlets, bays, and the ocean—helps meet the demands for high quality fresh wild salmon and other specialties such as fresh wild salmon roe. Copper River salmon, for example, is a delicacy at fine restaurants and commands a premium price. The fish are hatched in the Copper River, but are caught off the coast before they have returned to the Copper River to spawn.

Yet the current fisheries management system, with its regulations of season and fishing gear, makes it difficult for fishermen of wild salmon to provide the one product that is unique to them—high quality, fresh, wild fish. (The seasonal nature of wild salmon fisheries is an additional drawback to consumers who want fresh salmon year-round.)

Salmon farming has emerged in response to the limitations of

wild salmon fisheries. For example, the race for salmon, which stems from the tragedy of the commons but also occurs under most government regulation, both increases the costs of fishing and decreases the quality of the catch. “When fishermen race, they can’t pay as much attention to quality. The salmon are handled roughly or languish on boats for hours before making it to the packing plant,” writes an *Anchorage Daily News* reporter (Loy 2002a, D1). In Alaska, where salmon runs are generally healthy, the problem is not so much that salmon are overfished, but that they are not carefully fished.<sup>14</sup>

Salmon farming developed to meet the year-round demand for fresh salmon. The technology was available, the rights were clear and enforceable, the quality was good, and the product was not seasonal.<sup>15</sup> “Initially, the primary market was ‘white tablecloth’ restaurants in the northeastern USA, but markets were soon developed throughout the country,” says J. L. Anderson (1997, 177). By the 1990s, farmed salmon was available for sale even in Seattle and Anchorage. The growth of the salmon farming industry continues. “It’s already the world’s fastest-growing food industry, with production increasing more than 10% a year,” wrote a reporter for *Time* magazine in late 2002 (McCarthy 2002, A10).

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## A NEW SYSTEM OF RIGHTS?

How can the salmon fisheries of the Pacific Northwest become more profitable while protecting the resource that generates the wealth? The lesson from the Native American fishery is clear. The Indian system, rooted in enforceable, exclusionary property rights, worked well. But because the property rights existed to sites and not to the fish themselves, the system was ultimately doomed, even if the white settlers had not altered the system.

The Stevens’ treaties, which eliminated Indians’ exclusive ownership of fishing sites, coupled with open access and a dwindling

respect for site rights, resulted in a tragedy of the commons, as fishermen raced to catch the fish first. Regulation attempted to end the tragedy, but regulation-based salmon fisheries are far from optimal. Short seasons and gear restrictions fail to improve the fishery, while often harming those trying to earn a living.

Limited entry, which reduces the number of legal fishermen in a fishery, is a more recent regulatory approach that has been tried in many Pacific Northwest fisheries. While it reduces fishing pressure, the expensive race for fish continues because the remaining fishermen (especially if there are still too many) try to out-catch one another (see Leal 2002, 6–8).

In contrast, a private property rights regime could improve the fisheries. One optional step in this direction would be a system based on Individual Transferable Quotas (ITQs) or Individual Fishing Quotas (IFQs).

## TRANSFERABLE QUOTAS

ITQs not only limit the number of fishermen, as does the limited entry system, but they limit the number of fish that each fisherman/quota holder can catch. In a fishery using ITQs, the government or management council continues to set an overall total allowable catch each season. What is different is that each fisherman has a right to catch a certain portion of the total allowable catch of that species. So a fisherman who holds a 0.1 percent share in the South Atlantic wreckfish fishery that has a total allowable catch of 7,400,000 pounds can catch 7,400 pounds of wreckfish that season (Leal 2002, 8). This share is transferable; in essence, the fisherman has a property right to that portion of the catch. The fisherman may buy or sell this share.

Properly designed and enforced, an ITQ system can prevent both overfishing and the race for fish. Each fisherman can be confident of the amount of fish that can be caught. This prevents the destructive competition that leads to excessive fishing. ITQs have



been adopted around the world, including in British Columbia, New Zealand, and Alaska for certain species of fish. So far, they have not been used for salmon in the Pacific Northwest.

Salmon are anadromous; they are hatched in freshwater and remain there until they venture out to sea, later returning to the same rivers and streams in order to spawn. Because of this extensive migration as well as other factors, it is difficult to know in advance the size of annual runs, and therefore it is hard for managers to set a total allowable catch that can be divided among ITQ holders. Yet setting a reasonable total allowable catch is important because escapement rates (the quantity of salmon that re-enter the river and lake system) are critical to future salmon runs and to the health of the river system. If too few salmon re-enter the freshwater system, future salmon stocks there will be reduced. If returns are consistently far too low, the genetic variability of salmon and their resilience as a species may decrease.

With some adaptations, ITQs could be applied to salmon (Leal 2002, 27–29). For example, if ITQs could be set daily (reflecting rapidly changing knowledge of the numbers of salmon in the runs) there would be a greater likelihood of achieving optimal escapement rates. Another alternative is setting a baseline total allowable catch and modifying this catch during the season as the actual run size becomes known. This would let fishermen know before each season the minimum amount of salmon they would be able to catch. A third alternative is for fisheries managers to build forecasting models based on historical data. Each of these has advantages and disadvantages, but each could be a significant improvement over the present system.

If ITQs were applied to salmon, fishermen could fish at the times best for them, rather than spending money on expensive gear to be the first to catch the salmon. They could also consolidate effort and equipment, selling what they no longer need. The ability to trade and sell ITQs encourages the quotas to “end up in the hands of the most efficient fishermen” (Leal 2002, 9). Salmon

husbandry could once again become attractive and profitable, as it apparently was in Indian times (Johnsen 1999, 7). Finally, ITQs would allow the various demands for salmon to be met. Site-based fisheries for canned salmon could coexist with trollers for Copper River fresh salmon, without racing for fish.

In spite of their success, ITQs have political and legal hurdles. In addition to the technical problem of setting the total allowable catches and escapement rates, there is an inherent difficulty in moving from a regulatory system to a rights-based system. The initial allocation of ITQs would be a complicated and touchy issue, as diverse interests try to maximize their individual allocations (Leal 2002, 32–35). Existing licenses should be respected and their market value recognized. Doing so will facilitate bargaining. In addition, recreational fishing plays a prominent role in the mix and ITQs could be adapted to the recreational fishery. This, however, will not be easy.

Many states, such as Alaska, would have to legislate the use of ITQs in state waters. (Waters are owned by the state three miles off the coast, while waters beyond that are owned federally, up to 200 miles offshore.) Even with these obstacles, a system using ITQs is likely to deliver better results than the current system, and at a lower cost.

## PRIVATE HARVESTING AGREEMENTS

Another possibility for improving the salmon fishery is found in private harvesting agreements (PHAs). These were developed in the United States while a congressionally mandated moratorium on ITQs was in place. PHAs are voluntary contracts among fishermen, who agree to divide a government-set quota among the PHA members. PHAs do not constitute permanent property rights, although the private agreements are legally binding. To be effective, PHAs must be relatively small, says Leal (2002, 35–36), and the members must share a common interest in controlling

the catch.<sup>16</sup> “Although not as durable as ITQs,” writes Leal, “they can be quite effective in ending the race for fish and eliminating overcapacity” (Leal 2002, 35).

Private harvesting agreements have already had some success with salmon. The Chignik Plan, the first salmon cooperative created to address the race for fish, was developed by fishermen in the Chignik fishery (along the Alaska peninsula). They are trying to compete with farmed salmon by reducing costs and improving the quality of their product.

Under the Chignik Plan, fishermen created a cooperative that decreased the number of boats that went out to sea, but all members received a portion of the proceeds (Loy 2002a, D1). By limiting the number of boats, the plan reduced overfishing, minimized costs, and avoided racing for fish. During the 2002 season, only 19 of the cooperative’s 77 members fished. “More than 50 commercial salmon fishermen have made \$20,000 each this summer in a remote Western Alaska fishery, and they did it without ever wetting their nets,” writes Wesley Loy (2002b).

In choosing between a system of ITQs and PHAs, several things must be considered. Because they are voluntary, PHAs avoid the political problem of legislating and allocating ITQs. On the other hand, voluntary agreements can be difficult to form and can easily break down. In addition, governmental regulations can interfere with—and even end—PHAs (Leal 2002, 46). The advantage of ITQs is that once the initial allocation is worked out, ITQs can exist as permanent, enforceable rights. That is the case in New Zealand. In the United States, however, they currently exist as permits rather than complete property rights.<sup>17</sup>

## EXCLUSIVE RIGHTS TO THE RESOURCE ITSELF

An alternative to ITQs and PHAs would allocate rights to natural populations of salmon. After maturing in the ocean, salmon return to spawn in the same place they were hatched. They re-

turn in droves, called runs, congregating at the mouths of rivers before they re-enter the river system. Because salmon populations come from, and return to, specific geographic areas in a river system, rights to these populations could lead to better management of the salmon's natal rivers and streams. Such rights would also provide the security of knowing that only the owner can legally fish the run, creating a direct incentive for the owner to maintain the run's health.

While such a system would be ideal in terms of incentives to protect the resource, the costs of developing such a system may well be too high to be realized. Just like ITQs, rights to runs would have to be allocated, which is no easy task. Also, the technology to track and monitor runs accurately must be available so that fishermen can discriminate between different salmon runs and between salmon and other species of fish (Huppert and Knapp 2001, 81–82). Uncertainty of tracking salmon stocks at sea is a major obstacle. While owning salmon runs may not be feasible now, it may one day become a creative solution, if costs are lowered and better technology becomes available. And if ITQs are established, ownership of fish runs may evolve.

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## CONCLUSION

A property rights approach can better address the problems in the salmon fisheries of the Pacific Northwest than today's approach, which meshes a commons with regulatory measures. Property rights worked well for the Indians of the Pacific Northwest coast, enabling the Indians not only to subsist largely on salmon but to build substantial wealth. In contrast, the open access fishery and ensuing regulatory regime have mostly failed. Both our pocketbooks and our resources have been harmed as a result.

Returning to a property rights approach, whether through ITQs, PHAs, or even rights to specific salmon populations, offers

a better answer. Through property rights, the strong demand for salmon can be met at lower cost, salmon populations can be healthier, and the divisiveness and conflict over the race to fish can fade away.

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## NOTES

1. The term *fishery* includes one or more species of fish in a region and the fishermen and vessels that pursue the species.

2. The term *tragedy of the commons* was coined by Garrett Hardin (1968).

3. In line with some economists' views, this paper recognizes that without open access, a commons can be managed as community property, and the tragedy of the commons may not result. Such a commons is sometimes called a managed commons.

4. Also, see Garfield (1945, 628).

5. There is no clear distinction between personal and household property. The distinction may depend on the tribe.

6. For a review of American Indian economic history within a property rights framework, see Anderson (1995). For a primer on the relationship between Native Americans' property rights and conservation, see Anderson (1996).

7. For examples from the Kwakiutl, see Codere (1950, 43–49); for Tshimshian examples see Garfield (1939, 197).

8. Names were important for Indians in the Pacific Northwest because they provided information about ownership. People acquired names and thus could lose them. Losing one's name meant losing one's rightful claim to property. Garfield provides an example of how the potlatch was used to enforce property rights: "The name Sadzan was taken from its former owner at a potlatch because he was caught stealing from another man's fur cache. When the thief and his lineage refused to make restitution for the crime, the name was taken as compensation" (Garfield 1939, 193).

9. Many Pacific Northwest Indian societies emphasized prestige (relative social stature among members of clans, between clans, and between tribes). As a result, rivalries would occur between clan leaders or tribes. Eulachon oil would be burned at potlatches. A chief giving a potlatch might attempt to burn large quantities of oil. This was a sign of his wealth, as well as his tribe's or clan's wealth. When the oil was burned, the fire might become so hot that it would force the other chief to move away from the fire, a sign of disgrace.

10. In 1854 the Indians probably did not know or imagine the extent to which whites would settle the area, and they certainly could not have anticipated the consequences.

11. Although salmon populations in the Pacific Northwest today are not necessarily overfished, many subspecies are listed as endangered or threatened. Habitat loss in the river systems (often from dams) and natural ocean conditions contribute significantly to the decline of salmon populations.

12. Eric Barnes, a set-gillnet fisherman who has fished in Alaska since the 1960s, recalled that fish used to be laid out on burlap on the beach for up to a day before being picked up by the cannery with a one-pronged pitchfork. Barnes also said that rotting salmon were also sometimes canned, as the process made it safe to eat (Eric Barnes, fisherman, telephone interview, July 29, 2002). Today, however, once brought to shore, fish caught by gillnetters are placed in totes with ice. The salmon are then taken directly to a weighing station where they are weighed and iced. This process helps keep salmon quality higher than in the past.

13. The author spent the summer of 2001 set-gillnetting along the Cook Inlet in Alaska. On non-fishing days, the author worked at Cook Inlet Processing, a former canning plant that is now a fresh and fresh frozen processing plant, with a sizeable roe processing operation. Processing salmon quickly was the priority, as price was determined by quality, and quality determined by the turnover time in processing. The higher grade salmon were the fish that had su-

perior scale counts, firmness of flesh, and good color.

14. James L. Anderson, professor, Dept. of Environmental and Natural Resource Economics, University of Rhode Island, telephone interview, April 9, 2003.

15. Anderson interview, April 9, 2003.

16. For a more in-depth discussion on private harvesting agreements, see Leal (2002, 35–46).

17. For a complete discussion, see Leal (2002, 46–50).

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