CATCH AND RELEASE MANAGEMENT IN BRITISH COLUMBIA

Bob Hooten is Fisheries Program Head, Ministry of Environment, for the Skeena region of British Columbia. He received his BS and MS degrees from Simon Fraser University and the University of Idaho, respectively, and in the mid-1980s was director of the steelhead management program on Vancouver Island, the work that inspired this report. Bob has fished steelhead for nearly 20 years, gradually coming to prefer the fly as his principal method of pursuit.

With its thousands of miles of coastline, British Columbia contains a dazzling array of steelhead streams. Records show that each year over 200 streams are fished, with fish caught, and at least that many more streams support steelhead but are not fished.

Streams range from smaller outer coast winter and/or summer steelhead producers to the large interior tributaries of major river systems such as the Fraser, Skeena, Nass, Stikine and Takit. Many of these rivers' tributaries—the Kispiox, Babine, Sustut, and Thompson—are world renowned for their exceptionally large, wild summer steelhead.

British Columbia management policy categories steelhead streams as hatchery, augmented, or wild according to their natural ability to produce wild steelhead. With one exception the 22 augmented streams and four hatchery streams are located in the heavily populated southwest corner of the province.

Wild streams, which clearly dominate the total provincial picture, occur throughout the coast from the U.S. border to southeast Alaska and into the interior.

A common feature of a large majority of British Columbia's steelhead streams is their low productivity. The smolt yield capacity is generally well below levels experienced in such more southerly environments as the Columbia basin, the historic center of steelhead abundance.

Regulations governing steelhead harvest in British Columbia must therefore be relatively restrictive.

Catch and release has become a major management tool to deal with this low productivity and the cumulative effect of competing habitat loss, heavy sportfishing pressure and/or high exploitation by commercial and Indian food fisheries.

Generally these streams are located in southwestern British Columbia. Most of the provincial data base associated with evaluation of catch and release has been compiled on Vancouver Island and therefore this report focuses on that experience.

The Fishery

Vancouver Island, a large coastal island adjacent to the heavily populated lower Fraser River valley, contains approximately 35% of the province's streams which sustain measurable steelhead angler effort and catch.

In recent years the island has supported 20% of the days fished, 25% of the wild steelhead catch, and more than 60% of the hatchery steelhead catch for all of British Columbia (Steelhead Harvest Analysis, 1968-1987). In the 1986-1987 season 5,000 steelhead licenses were sold to island residents and angler days totalled 57,000.

Stream-specific steelhead catches on Vancouver Island range from tens to thousands. Recently, more than half of the annual catch of 50-60,000 steelhead has occurred in only five streams and approximately 90% in not more than 10. The days-fished pattern was similar. Hatchery steelhead are available in 11 streams but in most of these only since the early 1980's. Wild steelhead dominate the total angler catch.

(Continued on page 11.)
STEELHEAD POLITICS
IN WASHINGTON

Our associate editor has been trying to understand fish management politics in Washington state since the mid-1980s. "Trying," because the process is only vaguely understood by the public (including, probably, thousands of steelheaders) and sometimes makes no sense. Here he discusses some troubling issues relating to wild steelhead management, and to public awareness about wild steelhead, that will be much at issue in the next few years.

The Washington Wildlife Commission on February 8 voted unanimously to close the Skagit/Sauk River system to its traditional March-April catch-and-release wild steelhead fishery. Other Puget Sound rivers were similarly affected. The commission's concern was over projected returns of wild fish, anticipated to be about ten percent below escapement goals set by the Washington Department of Wildlife. The commission opted for an ultra-conservative stance, fearing that any loss to hooking mortality was unacceptable.

The FFF Steelhead Committee was on the other side of this issue. It urged the commission not to close the fishery, which has a world-wide constituency. Catch and release never has been shown to be detrimental to wild steelhead. Indeed, the Committee pointed out that wild steelhead have prospered in the Skagit since wild steelhead release regulations were adopted in 1977, rapidly expanding from 2800 to about 10,000.

It also argued that typical hooking mortality, based upon the best evidence available (from British Columbia, as reported elsewhere in this issue of The Oyppit) is in the range of 3 percent rather than the 10 - 15 percent claimed by the department.

But the 1992 reality is that the Catch-and-Release management philosophy endorsed routinely by FFF, TU and other conservation groups is opposed in Washington by a powerful, vocal group of steelhead clubs and sportsmen's groups who claim to represent the majority of the 100,000 or so anglers who purchase steelhead punch cards each year. These groups, including a prominent Skagit River steelhead fishing club, lobbied hard to close the C & R fishery.

These groups for years have asserted that Catch and Release harms the resource through hooking mortality and harassment of spawning fish. Further, they claim that C & R is an elitist management philosophy foisted on the public primarily by fly fishermen who want the rivers to themselves. They have urged these management positions:

1) The spawning escapement goal is a maximum and a minimum. Wild steelhead above the goal should be harvested. Once those "excess" fish have been harvested, the river should be closed to fishing.

2) If a fishery is depressed below escapement goals, even slightly, C & R fishing should not be permitted.

3) There is no need to increase escapement levels by constraining the sports kill to increase steelhead harvest and provide more fish for the tribal fisheries. (This still-fostering sore — tribal allocations — remains a major irritant for these groups.)

Department of Wildlife managers, with historic emphasis on hatchery programs and liberal steelhead kill limits, have watched us slide into a crisis in wild steelhead with hardly a cry of anguish. Yet, incredibly, they continue to equate "recreation" with killing fish. Fishers' vocal opposition to C & R and reduced bag limits resonates with the long held positions and orientations of many department managers.

The department justifies its reluctance to expand current C & R regulations with the claim that the public will not support additional harvest reductions. This departmental worry reflects the findings of a statewide survey, covering the 1986 angling year, which showed that steelhead anglers are far less inclined than anglers of other species to voluntarily practice Catch and Release. So managers imagine the wrath (encouraged by the groups noted above) of the steelhead kill fishery traditionalists and the department continues to equivocate about protecting wild steelhead.

The Steelhead Committee, for at least three years, has been urging the department and the commission to openly and aggressively take the lead in trying to change fisher public opinion about the killing of wild fish. The managers apparently believe that this public education challenge is a problem for user groups to solve on their own.

Not until fall 1991 did the commission adopt wild summer steelhead release regulations on virtually all Washington rivers and streams. It did so at the urging of the Steelhead Committee and over the objections of the department and, at that, its decision was reached by the closest of margins on a four-to-two vote. So even though C & R has been accepted as a management tool on most Washington rivers, nowhere does the commission or the department publicly state the urgency of public awareness and acceptance of Catch and Release.

In recent years the closest thing to an official urging of C & R was a five-inch-square, two-column "house ad" in the Washington Game Fish Regulations which advised anglers "How to Release Fish Unharmed." The text of this notice, appearing well inside the regulations pamphlet, began thus: "More and more anglers are switching to catch and release fishing." There was no emphasis on steelhead. (As though all "fish," whether in lakes or streams, are the same.) Hardly a ringing call for the position that without C & R, wild steelhead are in deep trouble.

But even that tepid "endorsement" apparently was not very important to the department: In the current regulations pamphlet, for the 1992-93 season, the Catch-and-Release piece is totally absent, the victim of a space-saving effort by the technicians who put the pamphlet together. (The department assures us in the omission was not a "policy" decision. (a) One must wonder how the department decides about... (Continued on page 12.)
EDITORIAL: IS FFF UP TO THE TASK?

John de Yonge

The other morning the Northwest Regional Office of the National Marine Fisheries Service classified spring-summer and fall Chinook salmon on the Columbia-Snake Rivers system as threatened with extinction.

That action just trailed the decision of the federal Pacific Fishery Management Council to impose the smallest coastwide catch limitations in history on coho and other salmon returning to U.S. waters. Biologists, in fact, had warned that allowing any coho catch this year might bring specific wild coho stocks to extinction.

Readers of The Osprey and other journals devoted to the preservation of steelhead and other anadromous salmonids know also about the earlier listing of the Snake River sockeye salmon—four fish returned to spawning grounds last year—as endangered.

And they know that last year the American Fisheries Society, in a report that kicked many anglers awake, listed more than 200 stocks of wild West Coast salmonids as near annihilation or threatened with it. Many of those stocks are of steelhead from such famous fly fishing streams as Washington’s Stillaguamish River and Oregon’s Rogue and North Umpqua Rivers. Many stocks in British Columbia, still the Nirvana of steelhead fly anglers, are on the American Fisheries Society list and, according to the report’s authors, many more British Columbia and perhaps Alaska stocks would be on the list if any scientific information existed about them.

The Society estimates that scores of stocks are already extinct, including stocks of one of the finest sports fish of them, the sea-run cutthroat trout. Stocks of sea-run Dolly Varden char also face extinction or have already been wiped out.

The overall news about stocks of salmon and steelhead and of like problems around the nation with wild Atlantic salmon, trout and grayling—just to mention a few species—means that we fly anglers must face the obvious:

Unless we wish to see our fish and our sport disappear, we must devote less time to talking about the fish and how to catch them and more time—and money—into turning ourselves into conservation activists working with like-minded conservation groups to rectify and reverse the causes bringing on the crash of wild stocks.

One way to do this is for the Federation of Fly Fishers to turn itself into a true national presence to be reckoned with in the halls of Congress, in the halls of the state and provincial legislatures, in the federal, state, county and municipal offices where daily decisions often decide to let a watershed and its environment for fish be damaged—and in some cases destroyed.

Transforming the Federation would not be easy. The Federation would have to start a deliberate campaign to recruit new members in order to enlarge its sway, treasury and brain power. (Trout Unlimited has more members in Washington state, for instance, than the FFF has nationally.)

The Federation would have to open a Washington, D.C., office, regional offices and, ideally and eventually, state offices in order to make its presence known, felt and appreciated.

The Federation would have to look to its major publication, The Fly Fisher, to become not just the premier journal of the joys and beauties of fly fishing, but also to become the premier journal enlightening fly anglers and other readers about the scientific knowledge about what is happening in our fly fisheries, about the political actions impacting those fisheries and about what we as fly anglers can and must do to preserve our fisheries and our sport for our offspring and off into the final generations.

In short, the FFF would have to focus itself on the total political and natural environments that determine whether wild (Continued on page 16.)

QUICKLY . . .

The Washington Wildlife Commission closed on March 1 the Skagit River to the taking of all wild steelhead, including the hook-and-release fishery in March and April.

The commission followed biologists’ recommendations—seconded by Skagit Valley anglers opposed to hook-and-release fisheries—to close the Skagit because the wild steelhead escapement would fall 10 percent under 10,300 fish. That number is the escapement that department biologists say is optimum for the Skagit.

The Steelhead Committee of the Federation opposed the closure of the hook-and-release fishery on grounds that the department’s 1992 escapement numbers failed to stand up under mathematical analysis.

The FFF particularly argued against department contentions that hook-and-release fisheries kill more than 10 percent of all fish hooked.

The FFF—given three minutes to make its case in front of Wildlife commissioners at a public hearing—produced a British Columbia study of hook-and-release mortalities, which are under three percent for fish hooked on artificial lures having single, barbless hooks. (See The Osprey’s lead piece, this issue.)

The hook-and-release fishery could go on, Steelhead Committee members said, if the hook-and-release fishery were limited to artificial lures with a single barbed hook.

Commissioners said later that they voted on the side of what might do the least harm to the fish. They instructed department staff, however, to produce more supportable figures in future discussions about wild stocks.

The Steelhead Committee has asked the Department of Wildlife to develop a consistent policy for managing steelhead statewide, pointing out that while the Skagit is being closed, fishing continued elsewhere on wild winter and spring steelhead stocks far more depleted than those on the Skagit.
"Lucky Al" entertained us in our last issue with his immodest tale of catching a bone steelhead before an astounded audience. In this recounting he provides some useful tidbits for steelheaders who occasionally enjoy a change of pace and venue, looking for a different anadromous quarry, and in the saltchuck.

Often, while crossing a Safeway parking lot or at a Costco exit, or even at First and Pike, I have been accosted by mature men, matrons or mubble young ladies, asking was I Lucky Al, the semi-well-known Cutthroat Fisher, how I got started chasing Sea-Runs, and would I reveal all my secrets. Normally closed-mouthed, I usually murmur "because they are there," as do mountaineers and hang glider pilots.

Truthfully, I got mixed up with Cutthroats inadvertently, being more a stream-bound trout and steelheader for uncounted years, favoring rock-hopping and wading swift currents. However, at one point my feet quit on me, wading became more hazardous than usual, and trudging the bouldery streambeds became greatly painful. So I reluctantly resigned myself to the skiff and fishing a bit.

Several of my fishing compatriots, among them Ed Foss, old Cut himself, claimed that sea-runs could be had on beaches and estuaries here and there on the Sound and Hood Canal. He even introduced me to a couple of beaches near Belfair, where I became hooked, or at least the learning process began.

After over thirty years of salty cutthroating there still is much learning to be had, but I have arrived in the vicinity of several conclusions, none of which will help a great deal in catching 'em consistently. Cutts are not consistent. That's conclusion #1.

They have also been regarded as "Fall Fish," pretty much following the salmon spawning runs. Balance (Conclusion #2). I forget #3, 4, and 5. I have satisfied myself that most of the myths surrounding the mystical cutts can safely be ignored.

I have had some success exploring, just mooching a small streamer along a promising shore behind the ears. I favor, however, drifting along, casting toward (sometimes almost onto) the beach, and stripping in fast or faster, covering water from a foot to six or eight in depth. This can introduce you to cutts, or at least to weeds, flotsam, barnacled rocks and assorted seaweed, like clams and oysters. Oysters are particularly fond of flies, striking viciously, often gumming leaders to shreds in their eagerness.

Beaches vary wildly in geography, from shallow mudflats through small gravel slopes to rough rock and boulder shores. (Continued on page 18.)

**THE CHAIRMAN'S MEND**

**Pete Soereel**

As we get a bit longer in the tooth we all are prone to lament that "it ain't like it used to be." With regard to wild steelhead, the unfortunate reality conforms to the lament.

How bad is it? The other evening, my fishing pal Bob York called and advised me to cancel our planned April steelhead trip to southeast Alaska. "The weir count is 90 percent below average. It is the same everywhere. Save your money. It's not worth the trip."

The spawning escapement on British Columbia's Thompson River hovers around a thousand steelhead; a sad remnant of a massive run of incomparable steelhead. Indeed, it is the same everywhere from southern California to the Aleutians.

The public agencies responsible for managing steelhead, including their harvest and habitat, have overseen the collapse of a species; it has happened on their watch. If wild steelhead are to survive, it is way past time for us simply to be mad. We must take up the sword.

Editor Jack de Vogue urges the Federation of Flyfishers to take the lead in developing coast-wide recovery plans for our wild salmonids. I enthusiastically support his call. Over the past several months the Steelhead Committee has examined steelhead declines and reported to FFF leadership that past land use, harvest and hatchery practices have compromised seriously the incredible variability and generic diversity of Pacific salmonid stocks, including especially wild steelhead.

Without prompt action, the Committee is convinced that the steep slide toward extinction (already well advanced) will almost certainly accelerate. The Steelhead Committee noted the extensive documentation of the rapidly declining wild steelhead populations, especially the 1991 American Fisheries Society report, "Pacific Salmon at the Crossroads," which lists more than 200 west coast salmonid populations at elevated risk of extinction, including many. (Continued on page 17.)
STEELHEAD HABITAT

Dr. Hal Beecher is a 13-year veteran biologist in the Habitat Management Division of the Washington Department of Wildlife. He has focused on stream flow requirements for fish, fishery project migration and stream fish ecology. Before coming to the Department of Wildlife, he served as a wildlife biologist and aquatic ecologist for The Nature Conservancy in Washington and Oregon. Hal received his Ph.D. in ichthyology from Florida State University in 1979. He enjoys fly-fishing for trout and steelhead, using anything that might work. This is his first contribution to The Osprey and we welcome this important contribution to a subject of increasing importance in our understanding of steelhead declines.

What kind of habitat do steelhead need?

Most experienced Northwest anglers intuitively recognize a good stream. Key ingredients are flowing water of good quality and quantity, access to the sea, adequate cover, and suitable spawning habitat. Fish habitat includes an adequate food supply. These features are necessary for any of our anadromous salmonids, but each species has slightly different requirements.

Steelhead spend several crucial stages of their life history in rivers and streams. They spend more time (usually from two to three years) rearing in freshwater than any salmon. The quality and quantity of freshwater habitat is a major influence on steelhead production. Each life stage has different needs, and needs vary seasonally.

Water Quality. Water quality, in the narrow sense of physical and chemical characteristics, is essential for all life stages. The U.S. Fish and Wildlife Service’s Habitat Suitability Index (HSI) model for rainbow and steelhead trout emphasizes water quality as the biggest factor explaining differences among streams that support many, a few, or no steelhead/ rainbow trout. Fortunately, water quality is good enough in most Washington streams that other influences on the well-being of steelhead are quite evident here. However, the threats to water quality increase. Only public vigilance can protect water quality.

Important aspects of water quality are temperature, concentration of dissolved oxygen, suspended material, and dissolved substances. Some of these factors interact. More oxygen can be dissolved in cold water than in warm water.

In warm water fish have a higher metabolism than in cold water, and thus a greater need for oxygen. As fish become more active in warmer water they may become more sensitive to pollutants.

Some Northwest streams are vulnerable to overheating if streamside shade of riparian forest is removed. Others are relatively insensitive to heating.

Suspended material (silt, mud, and even fine sand in fast water) settles into spaces in the gravel as flow subsides. This can hinder cleaning and oxygenation of incubating eggs. Hydrological and sedimentation cycles also influence the condition of hay, or other fine material before it reaches the stream.

Water Quantity. Quantity of flowing water, or instream flow, controls how deep and how fast water is flowing over a particular section of stream channel and the associated habitat features as cover and spawning gravel. Flow influences how much total area of stream bottom is wetted and available as habitat for trout or other food organisms. Both quantity and quality of steelhead habitat are dependent on instream flows.

Secondarily, instream flow influences access to different stream reaches and aids seaward migration of smolts in the spring. Flow through gravel cleanses and oxygenates incubating eggs. The rate and quality of flow through gravel is related to instream flow and gravel characteristics. The closest thing to an absolute criterion I have observed for trout habitat is that water must be at least half a foot deep, less than that and it won’t be inhabited (except by newly-emerged fry less than two inches long). Deeper pools, particularly those with good velocity and cover, are preferred habitat for steelhead parr. Steelhead parr also use open runs and riffles shunned by young coho.

Access to the Sea. Without access to the sea a stream can support resident trout but not the sea-going steelhead with their tremendous growth. Bruce Crawford, a fish biologist who is now assistant director of the Washington Department of Wildlife, measured vertical heights over twelve feet where he saw steelhead jump over waterfalls. With their leaping ability and migration timing, steelhead can get to waters accessible to no other anadromous fish except Dolly Varden/bull trout.

In the past century bad culverts and dams have drastically reduced the miles of stream accessible to steelhead. In a few cases, such as at Sunset Falls on the South Fork of the Skykomish River, Granite Falls on the South Fork of the Stillaguamish River and Tumwater Falls on Washington’s Deschutes River, fish ladders and trucking have extended fish passage beyond where steelhead could go a century ago, but such gains pale before losses to dams. Fish have to migrate both directions in order to propagate themselves, a lesson the Federal Energy Regulatory Commission has had difficulty understanding with its ruling just recently junked, that dams had to afford anadromous fish only upstream passage.

Cover. Any successful angler recognizes good fish cover but fish biologists have difficulty quantifying it. Cover provides hiding places for fish and/or reduces current velocity. Commonly recognized cover types include overhead cover (vegetation above the stream surface), in stream cover (logs, boulders, brush piles), surface turbulence and deep water. Different cover types function differently.

The importance of overhead cover in Northwest streams varies. Overhead cover influences water temperature and in-stream plant growth by restricting sunlight penetration. In some cases, removal of overhead cover can stimulate plant production. (Continued on page 20.)
WHO SPEAKS FOR THE SALMON?
A CONCERNED BIOLOGIST DOES

Jeff Cederholm won his bachelor and master of sciences degrees from the University of Washington College of Fisheries. For some twenty years he has studied forestry/ fisheries interactions from Washington to Alaska, both for UW's Fisheries Research Institute and, for the past ten years, for Washington's Department of Natural Resources. Jeff recently was presented with the prestigious Roderick Haig Brown Award for "outstanding achievement in his ability to transfer scientific information in fisheries to the non-professional." Jeff says his work denies enough time for as much fishing as he would like, especially the pursuit of steelhead and resident cutts, many of which he releases.

Each year I pause and reflect on my career as a salmon biologist. I think of the beautiful streams and rivers I have had the privilege to study. And always comes the question: Who speaks for the salmon? My answer: people just like me.

Unfortunately, I look around and see that too many biologists have spoken for the catch of salmon and few have spoken for the salmon's welfare.

I used to spend many hours on a productive Hood Canal stream. I recently learned that it has been just about wiped out of its natural chum salmon population, probably due to heavy fishing pressure in Hood Canal.

Without question, tremendous amounts of salmon habitat have been lost and degraded since man moved into the state of Washington in the mid-1800s. Logging, farming, dam building, and urbanization have taken a major toll on the natural salmon habitats of this state. One has only to read the daily newspaper to realize that once mighty salmon runs are succumbing to the power of technology on the upper Columbia River.

These losses will continue, as our human population expands into the many river basins of this state. Considering how much we have changed our rivers, it is truly a wonder we still have salmon at all.

The chinook, coho, sockeye, pink and chum salmon are all managed by our Department of Fisheries. The steelhead and cutthroat trout are managed by our Department of Wildlife. If habitat degradation were not enough, the coho, chinook, chum and steelhead also have been affected in a much more subtle way: by unwise hatchery practices.

In fact one can clearly see where the priority lies in those agencies, by comparing the large amount of money spent on hatchery-produced salmonids relative to the amount spent on natural salmonid habitat protection.

My undergraduate and graduate degrees are both from the University of Washington College of Fisheries. As an undergraduate, my education was steeped in the assurance that fishery biologists were created to "give the public all the salmon they want." I fear this concept has missed the mark because the public wanted more salmon than the natural resource is capable of giving. We spent much of our time studying hatchery production techniques, and very little time studying natural salmon populations and their needs.

It wasn’t until my later graduate work and my career in fisheries research that I really gained a clear picture of the contradictory job that often faces unprepared fishery graduates: feeding the insatiable appetite of commercial and sport fishermen, while looking out for the salmon’s welfare.

Over my 20-year career I have studied six of the seven species of salmon, from the mighty Columbia River and majestic Olympic Peninsula to Alaska. I’ve seen many natural salmon runs. But I’ve also seen far too many hatcheries and the consequent horrific toll they take on the very viability of our natural salmon runs.

I fear the effects of hatchery operations have been far more destructive than has been openly admitted.

Hatchery operations have led to gross overfishing of our natural salmon runs, (Continued on page 13.)
THE WILD STEELHEAD CAMPAIGN

Osprey Staff

This report, first published in British Columbia in January, describes an exciting movement by our Canadian friends to halt the rapidly declining Skeena River steelhead fishery. The Wild Steelhead Campaign is a major project by the Steelhead Society of British Columbia and most of our B.C. readers already have seen this account. However, The Osprey is running it here because of its importance also to non-Canadian steelheaders as a model of a grass-roots effort to get control of a bad situation. There should be lessons here for "lower-48" managers and fishers as well.

In the spring of 1991 a group of anglers from the northern chapters of the Steelhead Society of British Columbia decided to take a more active role in fighting the declining steelhead on the Skeena. They had no idea of what they were getting into, and were "incredibly naive" about a lot of things. The basic idea was to make a video about what's happening on the Skeena.

However, as the 1991 season unfolded, support for the effort increased because the international fishing community began to realize that the legendary rivers of the Skeena system fast were becoming "legends" in the true sense. Tom Porto's article in Trout magazine led the way and the constant vigilance of Frank Amato was telling. Egor Boyanowski, then president of the Society, gave us his total support and was a passionate advocate for wild fish in every forum he could find. Yvon Chouinard came on side with generous financial help and the Campbell River chapter signed up early on.

The Wild Steelhead Campaign shows that sportsmen everywhere have had enough of the destruction of wild fish stocks.

During the summer of 1991 over 700 gillnetters and 400 seiners entered the approaches to the Skeena and Nass Rivers and showed that the Department of Fisheries and Oceans (DFO) had no control of the fishery.

Wild stocks of coho, chinook, and steelhead were devastated as these commercial fishers harvested enhanced runs of sockeye, in spite of the fact that the mandate of the DFO clearly is to be concerned first with conservation.

Despite a growing body of evidence that points to major damage to Skeena salmonid stocks, the DFO persists with a management regime that allows this damage. As the data showed, it became clear that there were many stocks of fish in the Skeena that are in big trouble. One doesn't have to go to the Columbia or Snake to find stocks of fish going extinct. It is happening right in British Columbia and the B.C. government is causing most of the problems.

The Wild Steelhead Campaign is the concerned anglers' attempt to do something about it.

This independent project of the SSBC aims to work changes in the way DFO (a federal agency) does business in B.C. The first attempt was making a video to dramatize the Skeena's problems. This is ongoing and requires continuing fund-raising funds for the video and for producing a document which will address fundamental issues of fisheries management policies.

It is an enormous undertaking but the consequences of inaction would be the eventual destruction of the entire early component of Skeena summer runs of steelhead and coho, not to mention wild stocks of the other species.

This is not the first attempt to call attention to the Skeena's plight. For many years a dedicated group of anglers has tried to arouse public awareness but with limited success. The Skeena Watershed Sportfishermen's Coalition, consisting of SSBC chapters, the B.C. Wildlife Federation, and guides, formed the main effort in the northern province.

The damage would have been worse if not for these local folks who have stood up to the DFO. They provide the representation to the Skeena Watershed Committee, which is a group made up of four representatives each from the commercial, native, and sportfishing sectors, and two representatives each from the Ministry of Environment (provincial) and the Department of Fisheries and Oceans.

This is a new committee, formed to deal with these issues, and only time will tell if the process will succeed. But it is clear that the process is in place, but because of the pressure brought by the sportfishing sector. It is also clear that success will come only by educating the public and its politicians about the severity of these management problems.

One has only to look at Newfoundland to see the consequences of bad management and inaction. The situation there is a classic example of denial, the ability of users of a natural resource to kid themselves that everything will be okay.

Similarly on the Skeena the commercial fisherman believes that stocks are healthy. This, because of the massive enhancement of Babine sockeye stocks. A gillnetter sees good catches of sockeye and pinks, but these are the only stocks that DFO usually considers in management decisions.

It is the sportsman who sees the small streams and tributaries of the Skeena that are almost devoid of fish. We are the ones who witness the gradual decline of coho stocks. We now recognize that the genetic diversity of these stocks is critical to the health of the Skeena.

Some of the latest issues of commercial fishing journals tell of huge-enhanced runs of pink salmon from Southeast Alaska that are showing signs of stress. Low average weights, diseases and other problems are cropping up, and it appears that once again all is not well in hatcheryland. Why is this not a surprise?

And how much poor quality pink salmon, at any price, can the general public consume?

Study after study, royal commissions, all have illustrated the problems besetting the commercial fishing industry. Overcapitalization, poor quality product, over capacity, poor return to the taxpayer, all are problems that have been clearly spelled out, but there has been no will to change, to do something about these problems. The commercial industry must be made to realize that it exists at the sufferance of the public, that it survives on a public (Continued on page 11.)
LETTERS

Editor, The Osprey

Keep up the good work. Very good reading.

Bob Bettig, Snohomish, WA

Editor, The Osprey

Thanks for adding me to your mailing list. Enjoyed reading Issue No. 14, although the subject matter was pretty grim. Oregon wasn't featured, per se, but things have been going downhill here also.

Keep your backcast up,

Dick Williamson, Beaverton, OR

Editor, The Osprey

Mr. Soverel! Enough of the pushy verbiage that smacks of remorse and hopeless romanticism!

If you are genuinely concerned about steelhead (which are not more significant biologically than any other species in the Skagit or other systems) as a result of interspecific competition Pacific salmon far surpass steelhead in exploiting freshwater habitat both temporally and spatially - even under pristine conditions steelhead account for the smallest percentage of the anadromous cohort of the fish community, perhaps you could direct your amorous rambling toward the perpetrators you identified, and save space in the newsletter for rational discussion, but more so toward the elected civil servants both regionally and especially locally. Their policies (or lack of) are the true reasons for what is wrong with the Skagit system.

Among the exploiters of this resource fly fishers (I am one) are guilty of seducing vulnerable steelhead spawners with sophisticated tackle and forcing them to struggle for exhaustion for the perverse pleasure of "treasuring the connection through the fly line . . ." - rather demented behavior! As an alternative method to experiencing what is perceived to be wild and pure, I would suggest developing and applying the skills noted in Tom Brown's field guides.

The ultimate indicator is you (us)! Do we care enough about declining stocks of steelhead to stop fishing for them??!! We do have a moral obligation to set things right. PEOPLE need management, NOT FISH!!

Joe Shedlock, Mount Vernon, WA

To: Dr. Nathan J. Smith:

Your article on steelheader's elbow in The Osprey, January 1990, caught my eye. I am semi-retired from private practice and a former faculty member of the Dermatology Department at Stanford. As a chronic sufferer from steelhead fever with a recurrent elbow problem, from personal experience I offer these additional suggestions:

1. Use a lighter, shorter rod. I can cast a six-weight 8 1/2' outfit all day, but the eight weight 9' rod makes my elbow sore. Sometimes just using a shorter eight-weight works because of the decreased leverage.

2. In case the shorter, lighter rod fails to help, try the spey (two-handed) rod. This requires a different set of muscles and is easier on the elbow.

3. Cast with the other hand. I cannot cast well left-handed but I can manage short casts. Often these are the most productive.

4. Try to keep the wind at your back. Casting against a strong head wind places too much strain on the elbow.

5. If possible, stay with a floating line. Picking up and casting a sinking line requires considerably more force and tension.

6. Relax, do not "push" the cast, let the rod do the work, and reduce false casts to a minimum.

Yours very truly,

H. Joseph, Vallejo, CA

Editor, The Osprey

Keep up the Great Work. You have produced and what should be expanded as the "recognized" Journal of North American Steelhead.

I'd like to suggest a public-angler subscription solicitation for Osprey. I believe there is a need to reach more anglers. Many more people need to get involved to form an effective Steelhead Conservation Army.

This could be mechanized by contacting Dick Thies, FFF EVP Communications (410 Shea Lane, Long Beach CA 90803) and asking him to develop and place a no-cost magazine ad of the pro bono variety that solicits angler participation in the FFF Steelhead Committee through a subscription to Osprey.

A basic Osprey subscription price — something like $9.95/year would be needed.

Marty Seldon, FFF Senior Advisor, Sunnyvale, CA

This following letter is a response to a letter from associate editor John Sager to Washington U.S. Sen. Slade Gorton in which Sager expressed concern over Gorton's public position on the need to weaken the Endangered Species Act. Gorton's response appears to be the kind of "caused" reaction to inquiries of this sort and probably speaks typically of the senator's view on ESA. Readers beware!

Dear Mr. Sager:

Thank you for your comments about the Endangered Species Act. I appreciate knowing your thoughts on this issue.

The Endangered Species Act lately has come under intense scrutiny. The protection of several species, including spotted owls in our forests and salmon in our rivers, has raised the level of public awareness about the Endangered Species Act.

When the Act was drafted in 1973, it was envisioned that it would protect species on a site specific basis. You probably remember the dam in Tennessee that threatened the Smokey Bear. That was a classic example of a problem the Act was meant to address. (Continued on page 14.)
WILD STEELHEAD MANAGEMENT AND CONSERVATION IN OREGON

Oregon Trout’s Steelhead Conservation Committee has prepared a landmark report (January 1991) entitled: Wild Steelhead Management and Conservation Issues in Oregon. The Osprey is pleased to present here a summary of that 43-page bound document which OT was kind enough to share with us. We apologize for the needed contractions and omissions but point out that interested readers may obtain a complete copy of the document directly from Oregon Trout: 5331 SW Madison Ave., Suite #228, Portland, OR 97201.

The challenges facing Oregon’s wild steelhead stocks are many and serious. Yet, no comprehensive examination of the issues involved has emerged from either the state agencies or from the public since the Oregon Department of Fish and Wildlife (ODFW) introduced its Steelhead Plan in 1986.

Recognizing the need to be better informed, Oregon Trout formed the Steelhead Conservation Committee and directed it to identify and analyze the conservation issues affecting wild steelhead in Oregon and to provide recommendations to solve the problems discovered. This report is the culmination of the committee’s efforts to fulfill that mission.

The report is the beginning of baseline knowledge on steelhead conservation issues and has helped Oregon Trout develop working relationships with key state managers and has improved OT’s expertise in steelhead conservation.

The report’s objectives are to: 1) identify and analyze significant conservation problems affecting wild steelhead in Oregon; 2) assess state and federal management as it relates to the problems identified; and 3) recommend conservation strategies that Oregon Trout should pursue to best deal with the problems identified.

The reporting methods centered on examination and analysis of conservation issues affecting typical basin/stock subjects, this to reveal general and state-wide conservation concerns. Summer and winter fisheries were examined in 13 individual water-sheds, to sample a varied mix of stock, geographic and management characteristics.

These examinations explored current and historic wild steelhead abundance, management objectives/plans, funding/resources, and factors limiting wild steelhead abundance. The principal limiting factor of the study was that no explorations were made east of the Deschutes River and, therefore, such conservation concerns as dam mortality were not addressed.

The principal problems identified:

1. The monitoring of wild steelhead population indices is generally inadequate to support biologically sound management.

2. Data concerning habitat, water quality and steelhead life history are lacking for many rivers in the state.

3. ODFW’s regional budgeting and accounting practices make it almost impossible to determine if wild steelhead management objectives and programs are receiving adequate funding, staff, and other resources.

4. The lack of instream flows seriously constrains wild steelhead production in many streams.

5. Unscreened irrigation diversions are a source of wild steelhead mortality in many streams.

6. Basin plans, which define long-term management objectives for wild steelhead, do not exist for many of the state’s steelhead rivers.

7. On many streams, management emphasis is on hatchery production and maximum sustained harvest. Inadequate attention is given to the effects of these practices on wild steelhead stocks.

8. The public is uninformed of the need for wild steelhead conservation.

Principal Recommendations:

Problem 1. ODFW should commit more resources to conducting steelhead stock population surveys. Each watershed used by steelhead should have spawning areas designated to be used to measure spawning escapement to verify program objectives. ODFW should have a steelhead specialist in each region containing steelhead. ODFW should revise the current punch card system to provide more information about wild steelhead population indices.

Problem 2. To avoid further listings under the Endangered Species Act by improving habitat management and protection: ODFW’s steelhead management section should seek funding to perform stream survey work. Data held by various agencies should be shared. ODFW and the U.S. Forest Service should continue work on watershed and stream classification methodology and should continue to reinvent the streams in the Columbia River basin to compare historic habitat conditions to present conditions.

The Oregon Governor’s office should conduct an audit of federal and state stream protection programs and regulations and evaluate their effectiveness. ODFW and the U.S. Forest Service should work cooperatively to implement the USFS Columbia River Basin Anadromous Fisheries Policy and Implementation Guide.

Problem 3. The focus should be the availability of information, rather than changing the Department’s budget format because the specific procedures and formats used are internal management tools. Departmental reports should lead with an executive summary of expenditures and resources for each project in a simple format indicating commitment to projects and species.

Problem 4. Most tools are already in place. The Legislature should be lobbied for changes to the prior appropriations system itself. State agencies should implement the statutes and regulations already in place and, with the Bureau of Reclamation, should promote water-efficient irrigation alternatives and make (Continued on page 14.)
THE WASHINGTON STEELHEAD SYMPOSIUM

"EDUCATION — INVOLVEMENT — MANAGEMENT"

Pacific Lutheran University
Columbia Center
September 26 and 27, 1992

READERS OF THE OSPREY ARE CORDIALLY INVITED TO ATTEND A STEELHEAD SYMPOSIUM, SPONSORED BY THE WASHINGTON WILDLIFE COMMISSION AND SUPPORTED BY THE FFF STEELHEAD COMMITTEE AND OTHER STEELHEAD FISHING ORGANIZATIONS.

THE SYMPOSIUM WILL PROVIDE UP-TO-THE-MINUTE INFORMATION AND EDUCATIONAL MATERIAL, IT WILL FACILITATE BETTER INVOLVEMENT BY ALL USER GROUPS IN IMPROVED STEELHEAD MANAGEMENT, AND WILL ATTEMPT TO DEFINE MANAGEMENT STRATEGIES AND PRIORITIES THROUGH DISCUSSION AND AN EXCHANGE OF VIEWS BY SPECIALISTS AND THE PUBLIC.

THE SYMPOSIUM WILL FEATURE WORLD-CLASS SCIENTISTS AND OTHER EXPERTS IN SUCH FIELDS AS HABITAT MANAGEMENT, HATCHERY OPERATIONS, HARVEST MODELING, AND AGENCY MANAGEMENT PRINCIPLES.

THE SYMPOSIUM WILL COVER THE FULL RANGE OF TOPICS IMPACTING ON STEELHEAD: HISTORY, CURRENT MANAGEMENT METHODS, THE HATCHERY-WILD DEBATE, HOOKING MORTALITY, MSH AND ALTERNATIVES, RUN SIZE DETERMINATIONS, BROODSTOCK PROGRAMS AND MUCH MORE.

THIS IS A UNIQUE OPPORTUNITY FOR THE SERIOUS SPORTSMAN/ANGLER WHO WANTS TO HEAR AND TO BE HEARD. THE SPEAKERS AND PANELISTS WILL RESPOND TO AUDIENCE QUESTIONS IN A TWO-DAY FORMAT.

MARK YOUR CALENDARS NOW: SATURDAY/SUNDAY, SEPTEMBER 26 & 27, PACIFIC LUTHERAN UNIVERSITY.

SEATING WILL BE LIMITED TO THE FIRST 300 REGISTRANTS. A CHECK FOR $10, PAYABLE TO THE WASHINGTON STEELHEAD SYMPOSIUM AND MAILED TO THE ABOVE ADDRESS, WILL SECURE YOUR PLACE. BOX LUNCHES AND SOFT DRINKS AVAILABLE FOR AN ADDITIONAL $5 EACH DAY. FREE COFFEE. DETAILS TO REGISTRANTS BY RETURN MAIL.
B.C. C & R MANAGEMENT
(Continued from page 1.)

Regulations History

Regulations governing wild steelhead harvest were uniformly liberal across all of British Columbia from the earliest days of provincial fisheries management until the late 1970s. At that time, under the sponsorship of the Salmonid Enhancement Program, many first-ever investigations of steelhead stock size and exploitation revealed the necessity for major reductions in daily and season catch limits.

On Vancouver Island these reductions were scheduled to take effect in 1980. Further restrictions included catch and release only for all summer steelhead streams and a monthly limit to avoid chronic over-harvest of the early component of the winter steelhead run (Table 1).

<table>
<thead>
<tr>
<th>Years</th>
<th>Steelhead Harvest Quotas</th>
<th>Per Day</th>
<th>Per Month</th>
<th>Per Year</th>
<th>Per River</th>
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<td>1959 - 1961</td>
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<td>1980 - 1986*</td>
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<td>1985 - Present</td>
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TABLE 1: SUMMARY OF MAJOR REGULATION CHANGES GOVERNING WILD STEELHEAD HARVEST ON VANCOUVER ISLAND STREAMS, PRE - 1959 TO PRESENT.

Coincident with the agenda to introduce reduced catch limits in April 1980 came a disastrous winter steelhead season in 1979-1980.

This necessitated an emergency catch and release regulation which was subsequently included in the formal regulations from 1980-84 (Table 1).

During this period hatchery programs were coming on line rapidly and anglers were provided the opportunity to harvest marked hatchery fish throughout the year.

By 1985 hatchery production goals were realized and wild steelhead harvest was eliminated entirely.

Evaluation of Regulations

The objective of the wild steelhead catch and release regulation on Vancouver Island was to stabilize and, it was hoped, reverse a steadily declining catch trend.

Data were available from annual mailed-questionnaire sampling of licensees to compare effort and catch success in the "pre" and "post" catch and release years. These data provided a basis for assessing the efficacy of the regulation.

A common criticism of catch and release was that it was "unsound" because steelhead

WILD STEELHEAD CAMPAIGN
(Continued from page 7.)

resource. It does not provide the right to destroy or damage fish stocks. And DFO does not have the right to lead this charge into oblivion.

The industry claims that sportfishers are asking for its destruction. Not so. An equitable, rational management regime, run by DFO, would only lead to healthier fish stocks and a healthier commercial industry. This should be obvious but it is not, yet, to the industry which seems to be its own worst enemy.

It becomes increasingly apparent that education is the key to resolving the issue. The facts and issues are on our side and the Wild Steelhead Campaign must get its story across to the public, to politicians, native fishermen and the commercial. This is what the Campaign is about and it has drawn the line at the Skeena. The battle is to be won here and now. No one will do it for us.

This is about more than steelhead: It is about our heritage and how we treat our planet. The changes must be fundamental and they will affect the futures of all of B.C.'s rivers including the Dean, the Thompson, and the lovely streams of Vancouver Island.

The Wild Steelhead Campaign presently is running a lottery, open to all readers of The Osprey. Called "Return to Steelhead Paradise," it will raise money for the video. The prize is a guided trip to the Skeena in fall 1992 (Oct. 17-24, from Smithers) with Trey Combs and Lani Waller as hosts. Rivers to be fished will be the Babine, the Bulkley, and the Kispiox. The trip will include world famous guides, deluxe accommodations and helicopter transportation between rivers. It promises to be the trip of a lifetime. There are four prizes, and only 1,000 tickets are to be sold, at $100 each.

Buy a ticket (or several tickets!) and help the Wild Steelhead Campaign fight for the future of wild fish. Or if you want to help by making a donation, write:

The Wild Steelhead Campaign
P.O. Box 550
Smithers, British Columbia
V0J 2N0
STEELHEAD POLITICS
(Continued from page 2)

communicating with its constituency. The regulations pamphlet is, after all, the singularly most widely distributed medium, for the fishing public, at the department’s disposal.

In other opportunities to advance C & R, both the commission and the department—in public pronouncements, news releases, presentations by senior officials—are stone silent. It is as though they truly fear a presumed large constituency out there who would rage at the thought of being told to release fish unharmed. And indeed they do fear them: The kill fishers’ spokespeople have the political clout that the Catch-and-Release crowd has yet to develop. Especially when those spokespeople include elected officials in the state legislature.

Example: The same Skagit River steelhead club which urged closing the river to C & R includes among its members at least two elected state representatives. Adorning the statehouse office walls of one of these lawmakers are autographed photos of “name” Skagit steelheaders. Another legislator—club-member is a publisher of newspapers in a Skagit-region legislative district. A third lawmaker from the area is the key sponsor of the Grandy Creek hatchery project, a project privately admitted to be “purely political” by the highest officials in the department and commission.

Lawmakers do not have to serve on budget or oversight committees to evoke fear and trembling in bureaucrats: The Washington state legislature has a well-earned reputation of being one of the most free-wheeling (some would say unaccountable) in the land. Vote-trading among members (you scratch my back - - - I’ll scratch yours) is pandemic. If you are an agency head or senior administrator in Olympia, you pay close attention to groups which include, or can successfully influence, elected legislators who, in turn, determine budgets and influence policy.

It is instructive also to peruse the literature of those who are opposed to Catch and Release and who support more and better hatchery operations. The Forum is a tabloid-format newspaper which supports such groups as the Salmonid Foundation, the King County Outdoor Sports Council and the Sportfishing Alliance. A recent issue printed a barrage of criticism aimed at C & R and its proponents. Some samples:

"It was apparent (at a meeting of the Sportfishing Alliance) that similar views were being expressed - - - such as the need for more hatchery fish. Catch and Release should be a personal choice and not mandated. Also, much confusion has been generated over hatchery fish and their compatibility with wild fish."

The steelhead chairman of the Salmonid Foundation wrote in the same issue:

**KNOTS THOUGHTS**

(Bob McLaughlin)

In his raft down the river Sam sped.
"In search of a steelhead," he said.
A strike, a slack line,
His reel did not whine.
He found that his blood knot had bled.

"This steelhead season we have been buried with articles from all sections of the media suggesting Doom’s Day for steelhead is just around the corner. Most of the articles have given major coverage to special interest individuals of questionable credential who profess allegiance to conservation of the resource.

"...based upon the present definition of spawner escapement goals, one spawner generates 37,736 parrs of smolts (sic). These parrs, in turn, generate about 1.5 adults returning back to their river. Harvesting at MSH (maximum sustained harvest) reduces the 1.5 "returning fish" to one adult for spawning! The efficiency of Hatchery fish is much greater (presumably greater than wild fish, etc), with one adult producing six to ten adult fish."

The steelhead chairman then closes with a message about the debate over the proposed Skagit closure, at that time still not resolved:

"...Option A would call for Catch and Release for March and April, over depressed fish runs. I find this interesting! Here we have a fly fishing bunch working on the (Wildlife Department) to permit them to allow a mortality of 10% on the depressed steelhead runs and permitting harassing of the others on their spawning gravel! This the same crowd that wants to do away with our hatcheries and have only wild fish! My wish is I hope the dreaded camel itch infects the crotch of these unworthy persons."

A letter from a reader to The Forum had this to say:

"In your last issue of The Forum - - - we were exposed to the blather of Peter Soverel.

"...This person is known to be piled high with the BS and short on facts. Typical of this person are blatant generalizations that everything is going to hell when in fact that is simply not the case!

"...The banner of his small interest group is SAVE WILD STEELHEAD. The agenda of his followers is to eliminate hatcheries that provide 85% of our Steelhead and have CATCH and RELEASE on the wild Steelhead. Nice situation for these elitists!

"Contrary to Mr. Soverel’s baloney, our wild salmonids are not severely depressed nor threatened with extinction."

So much for the literature of those who say they speak for most of Washington’s steelheaders.

The debate on closing the Skagit, in which the FFF Steelhead Committee clearly was in a numerical minority, well illustrates other serious problems. They are serious, at least, to those of us who continue to look for more effective ways to educate the public, the commission and the department.

At the hearing before the commission, public testimony, buttressed by statistics presented by the department, claimed that C & R on adult steelhead results in hooking mortalities of 10 - 15%. Department biologist surely knew this is a far overreach. The only mortality (Continued on page 16.)
B.C. C & R MANAGEMENT
(Continued from page 11.)

The research was conducted at Kechi River, an intensively monitored stream on northern Vancouver Island. A further indication of the consequences of catch and release was available from records on steelhead angled for brood stock for hatchery programs.

Angler Participation/Catch

The immediate response of anglers to wild catch and release, first imposed mid-way through the 1979-80 winter steelhead season, was a 50% reduction in days fished (Fig. 1).

In the following license year (ending in 1981) there was a similar decline in the number of licenses sold (Fig. 1).

The number of days fished remained at historic lows for three years, after which a strong upward trend developed. By 1985 the pre-catch and release angler days total was surpassed (Fig 1). License sales, though increasing, remained 20% below the pre-regulation level (Fig. 1).

License sales and days fished over the 1983-87 period were undoubtedly influenced by the rapid growth of the hatchery steelhead program. The extent of this influence—as opposed to a growing acceptance of catch and release—is unknown, but evidence presented below suggests the availability of hatchery steelhead was the dominant factor.

The number of wild steelhead killed by Vancouver Island anglers displayed a declining trend for more than a decade before catch-and-release restrictions (Fig. 2). This was due, in part, to growing perceptions of some anglers that their ability to harvest fish had been underestimated, that the regulations were too liberal, and that steelhead abundance was declining. The total catch of wild steelhead resulting in an unwise reliance on this "quick-fix" technology which is yet unproved. More than 100 hatcheries dot the Washington landscape, of state, federal and tribal ownership, yet the technology is not a proven one in the long term.

Hatcheries are destroying the very inner fabric of our natural salmon resource. Significant loss of stream specific genetic integrity, overharvest of natural stocks, and the spread of disease have significantly changed the salmon, a legacy that my profession should not be proud of.

Our technology-to-the-rescue attitude toward salmon production causes three major injustices:

(1) It allows significant loss and destruction of natural salmon habitat;

(2) It gives the public the false sense of great salmon abundance;

(3) It has left us an inferior surrogate.

Some biologists and their political leaders have been looking at hatcheries through rose colored glasses for far too long.

When will our citizens finally realize that our precious salmon resource has been gravely overexploited to the point where we need to give it a rest? Once-gigantic fish runs of great variety have been reduced to paltry meager proportions with little character.

Innumerable runs that were in tune with the ebb and flow of each local environment now have been simplified and domesticated. There is a mountain of literature that shows that we need to protect and preserve the genetic integrity of individual salmon stocks, yet we constantly transport eggs between drainages with little regard for their unique characteristics.

Many old timers have told me they used to be able to tell the difference between salmon of adjacent drainages just by their outward appearance. One can (Continued on page 21.)
LETTERS
(Continued from page 8.)

Nobody in Congress in 1973 imagined that the Act would deal with protection of species across an entire region as is the case with the spotted owl and may the case with certain species of Pacific Salmon.

Most members of Congress from the Northwest believe that we must find a way to address the issue of protecting species without destroying the lives of human beings. A better approach to deciding broad regional questions like spotted owl protection is to decide as a State, region and country, how much we are willing to pay in human terms to protect species, and then make that the limit of the reach of the Endangered Species Act.

I expect that Congress will revisit the issue of the Endangered Species Act in 1992. When that happens I will keep your thoughts in mind.

Sincerely,
Slade Gorton, United States Senator

Editor, The Osprey

We appreciate the efforts of your organization. Results are encouraging.

George and Martha Veith, Yakima, WA

Editor, The Osprey

I have always considered The Osprey to be the most informative in-depth publication about the fishing I enjoy. It's gratifying to receive a more fundamental approach to conserving our stocks than most magazines offer.

Sincerely,
Kurt Hedeen, Malaga, WA

Editor, The Osprey

I would humbly pose a conundrum, to wit: Most of us who receive The Osprey are relatively conversant with the biological and habitat factors severely impacting our western wild stocks of anadromous fishes. In other words, we fall into this "washed" group, or believers, if you will. Conversely, the "unwashed," who are critically necessary for forming a consensus of any large impact, are not being reached.

This is something to think about.
Dick VanDemark, Bellingham, WA

Editor, The Osprey

The Osprey continues to have knowledgeable and informative articles. TU and FFF publications could benefit from your example.

Fred Carter, Kent, WA

WILD STEELHEAD IN OREGON
(Continued from page 9.)

It is easier for farmers to sell unused water back into the system. An agricultural practices act, with guidelines for water use, should be established.

Problem 5. ODFW's efforts to implement fish screening need wide support to forestall business as usual. The Northwest Power Planning Council may offer opportunities to address diversion screening on steelhead streams in the Columbia Basin.

Problem 6. The legislature should fund ODFW's basin planning implementation schedule; alternatively, R&E funds could be used.

Plans must be monitored regularly for implementation and correction.

Problem 7. Better monitoring of wild steelhead population indices is a must. All streams should be placed on catch and release regulations in the face of inadequate data on wild steelhead abundance, until proven that hatchery programs do not pose a threat to wild stocks. ODFW should commit to measurable natural production goals.

Problem 8. Various public education programs for schools, civic groups and fishing/conservation groups need assistance, e.g. the Clark-Skamania Flyfishers' wild fish slide program. Also needed is better public awareness of wild fish issues. ODFW could produce a wild steelhead information brochure and distribute it with licenses and regulations. A prioritized list of key streams/stocks is needed, showing river status, why selected, and management objectives toward wild fish restoration. ODFW should prepare an annual report on wild steelhead populations to the Oregon Fish and Wildlife Commission.

CONCLUSION

On the surface it appears that there is good news to report on wild steelhead conservation in Oregon. The statutes and policies needed to protect and wisely manage wild steelhead are, to a large extent, in place and interest in wild fish within ODFW is high.

The bad news is that a lack of basic biological data and an under-bearing hatchery program almost completely neutralize anything good the committee found. Without the necessary data to demonstrate how and to what extent wild steelhead are being affected by human activity, it is virtually guaranteed that the statutes, policies, and good intentions will be of little value because there will not be enough pressure to enforce them.

Unfortunately, the state's hatchery program is exacerbating the problem. Until the public is weaned off the easy hatchery fix and made to confront the ecological crisis that looms over Oregon's wild steelhead, the motivation and resources required to gather enough data are not likely to be forthcoming.

The committee concludes, then, that while the intentions of ODFW, the legislature, and some of the other resource management agencies are generally amicable toward wild fish, the actual management of wild steelhead in the state is lacking a sound ecological basis.

We recommend that all avenues to protect wild steelhead from further decline (that is, catch and release, hatchery scale backs, and the like) be vigorously pursued until wild steelhead are managed on a sound ecological basis.
B.C. C & R MANAGEMENT
(Continued from page 13.)

However, the subjective interpretation of the author is that wild steelhead recruitment (i.e. abundance and catch) will continue to fluctuate annually in response to these other variables but at a substantially higher level than would have occurred in the absence of catch and release.

Angler preference studies conducted on Vancouver Island in the mid 1970s determined that, under the circumstances of the day (i.e. liberal catch limits, relatively stable total catch, little hatchery production), catch and release was not a popular regulations option (Hooten 1982).

Empirical evidence from the catch and release period confirmed that attitude, despite changes in wild steelhead stock status and increasing hatchery steelhead availability.

At Gold River, the most prolific wild steelhead-only stream in the region, angler days were declining during the 1976-79 period (Fig. 4, page 17). The decline continued through 1980, when catch and release came into effect. However, during 1983-87, angler days remained well below previous levels (Fig. 4) despite the fact that catch figures, and catch per unit effort figures, reached record highs.

In contrast, experience on four popular steelhead streams, where anglers had the option of fishing for both hatchery and wild steelhead, showed the number of angler days and the percent of the total Vancouver Island steelhead angler days increased steadily through the pre and post-1980 (Continued on page 17.)

Total catch of wild steelhead increased sharply during the catch and release period and remained well above previous peaks (Fig. 3).

Tagging studies revealed that a substantial portion (>30%) of the increase could be attributed to repeat captures (Hooten and Lirette 1986; Hooton 1979; unpublished Fish and Wildlife Branch data). It must be noted, however, that catches were also responsive to an unusually high abundance of wild steelhead in 1984 and 1985, a phenomenon that was observed elsewhere in British Columbia and throughout the steelhead range.

The response in wild steelhead recruitment from increased escapements that followed catch and release has not been measured and, in fact, could not be separated from the environmental influences and the contribution of hatchery adults which spawned naturally.

FIGURE 2. NUMBER OF WILD AND HATCHERY STEELHEAD KILLED BY ANGLERS ON VANCOUVER ISLAND STREAMS, 1968 THROUGH 1987.

STEELHEAD POLITICS
(Continued from page 12.)

studies showing such high figures have been done on trout. The few too-few studies on adult steelhead, notably in well-controlled conditions in British Columbia, show averages at about 3% and similar figures were found also in one TU project on Puget Sound's Green River. While not enough work has been done in this field, the applicable studies to date show mortality levels three to five times lower than those claimed before the commissioners.

Worse, the commission's public testimony format did not provide any opportunity to rebut these data. Department biologists are not invited to defend their arguments before the public. Only the commissioners may ask questions.

Of course, hooking mortality studies can study only those fish that are actually hooked; no one knows, on the basis of controlled studies, how many fish in a given season of river over a given time period are not hooked at all. Most fishers would intuitively insist that not all fish are hooked, by a long shot. Steelhead are notorious for moving up quickly in water too high/murky to fish or to prefer water which is impossible to fish efficiently. (And when is the last time any of us has seen a dead wild fish in a river, a victim of hooking mortality?!) The Steelhead Committee, as far back as 1987, urged the department to modify its steelhead punchcard system in order to measure and evaluate Catch-and-Release effort. The committee was told that such data was either not needed or would be too cumbersome to compile and evaluate. (Never mind that Idaho and British Columbia monitor C&R on steelhead and consider it an important evaluation tool.) Yet it is precisely this kind of information that would have been critical to an examination of the hooking mortality claims made by those who paraded the high figures before the commission. And it will be crucial in other debates that are certain to come along again, soon, and often.

Yet the department is totally unprepared and continues to refuse to modify the punchcard system: By its own actions it appears to reluctantly accept Catch and Release, but makes no effort to monitor its effectiveness.

The ever-mounting evidence shows a number of ways that professional managers could work more aggressively toward protecting wild steelhead. Not the least of these would be a serious effort to evaluate the effects of hatcheries, statewide, on wild stocks and then adjust present hatchery programs accordingly. Other tools clearly include lowering kill limits, expanding C & R, lengthening seasons in some cases to spread angler effort, and strengthening enforcement against the poaching of wild fish.

In a cash-strapped bureaucracy, many major reductions of effort means juggling priorities and resources, especially if hatcheries are to be assessed and enforcement strengthened. These kinds of undertakings surely deserve enthusiastic support from all segments of the angling community.

RE-PRINT POLICY

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Legislators and senior managers lament that the various angling groups should "get your act together and tell us what you want." This admonition is aimed at user group spokesmen who represent angling communities with sharply divergent views: views about the role of hatcheries, priorities for wild fish management, the role of C&R, and release, etc.

It is as if harmony among the user groups could somehow change the facts upon which the tough decisions must be made. These decisions depend on good science, expert and impartial evaluation of evidence and experience, and long-term vision about what is best for the future of steelhead. Such decisions should not depend on what the various user groups would prefer.

In this kind of leadership environment the welfare of wild fish is never central because legislators and senior managers still have not committed to putting the welfare of wild fish above the demands of the kill fisheries traditionalists.

This is why the department and the commission must lead, not follow. If wild steelhead are to survive and steelhead fishing is to prosper, management assessments and decisions cannot try to please everyone; management is not a response to a show of hands.

There are no easy answers to these conflicts. But one thing looms: User group pressures on managers may have more influence on how steelhead are managed than does that which the managers know to be best for the fish.

And fisher/readers who know in their hearts that C & R works, and that C & R is vital to the future of wild steelhead, and ultimately to all steelhead fishing, had best do what they can to convert a whole bunch of those 100,000 "recreationists" out there.

The FFF Steelhead Committee will continue the struggle, but we may be loosing and we certainly can't do it alone.

EDITORIAL
(Continued from page 3.)

salmon, steelhead, other trout, grayling and other sport fish continue to exist.

That would mean raising the funds to hire professional staff to undertake recruitment, raise more funds and install fear into outfitters who ignore or sanction environmental destruction.

The time is at hand, at the upcoming international FFF conclave at Calgary, for the FFF to debate whether it is going to transform itself.

And transformation must come. To wait longer, to wait passively, will mean the extinction of our fisheries, of our sport and ultimately of the FFF itself.
B.C. C & R MANAGEMENT
(Continued from page 15.)

period as the supply of hatchery steelhead increased to target levels (Fig. 5).

Hooking Mortality

The opinions that released steelhead die or do not spawn successfully, commonly heard from critics and opponents of catch and release, were refuted by data compiled from hooking mortality studies.

Among 3,715 steelhead angled on (Continued on page 19.)


FIGURE 5. NUMBER (PERCENT) OF STEELHEAD ANGLER DAYS AND TOTAL WILD STEELHEAD CATCH (KILL PLUS RELEASE), GOLD RIVER, 1968 THROUGH 1987.

CHAIRMAN'S MEND
(Continued from page 4.)

steelhead stocks. Based upon a partial review of historical records, several hundred stocks of anadromous salmonids are already extinct.

In summary, the Committee found that after a century of ill-advised policies and practices, our wild West Coast steelhead resources are in shambles:

- Most wild steelhead stocks are in real jeopardy of extinction;
- Hundreds of stocks are already extinct;
- Many, perhaps most, wild stocks are subject to significant over-harvest by both sports and commercial fishermen;
- The genetic quality and fitness of many remaining wild stocks have been compromised by inter-breeding with unifit hatchery stocks;
- The genetic fitness and suitability of most hatchery stocks are of grave concern, even to managing biologists;
- Harmful timber harvest practices, mining activity, hydro-electric development, massive water diversions and other forms of human encroachment have significantly degraded wild salmonid habitat;
- Resource managers have invested in hatcheries rather than habitat protection and restoration;
- Thousands of miles of still-sound steelhead habitat are virtually devoid of wild steelhead because dams compromise anadromous access for both adult and juvenile salmonids.

Without immediate and dramatic change, wild steelhead are probably doomed in most of their historic range. The long-term health of hatchery stocks without the infusion of new genetic material is uncertain.

Based upon the crisis condition of most wild steelhead stocks, the Steelhead Committee recommended to the Federation (Continued on page 18.)
CUTT SKIFFING
(Continued from page 4.)

some with shell or weeds or both, or snags, pilings, or riprap, and sometimes piers and floats and moored cruisers. You name it, there can be cutts about. Though they can range considerably from their natual streams, they often can be found near river and creekmouths. They seem to move around a lot, quite often in pairs or menages-a-trois, or quatre or worse. Hook one, stick around, maybe hook more.

Fortunately, cutthroats are not picky as to diet. Anything that moves is fair game, and will be attacked with vigor. Thus the angler's choice of fly patterns is quite broad, leaning heavily toward those simulating fry, candlefish, sculpin, small ducks and used condoms.

Among my favorite attractors are the Cutthroat Yellow and Orange-Orange, which imitate the Cutthroat Yellow and Orange Orange. I also rely on the greenover-white Candlefish tie, and occasionally a Macklir or a Sand Lance tube fly. And when I stumble onto rising fish I will switch my sink-tip for a floating line and a bushy buoyant dry to skate in front of the rise.

The wets seem more consistent, though. And one might also run into a stray steelhead, especially near a stream mouth. I suspect that the stechecs ask the cutts where the best lies and foodstuffs can be found, and the cutts will gleefully point out the nearest unsuspecting fly angler's offering.

I recall a fall trip to Belfair, where the WFFC had an eating, imbining and incidental cutthroat outing at the state park. Just off the mouth of Mission Creek a number of us happened on a flotilla of steelhead, lazily roaming along a weedbed, and they seemed hardly perturbed by our lashings and flatlings, nor the assorted flies zipping across their path. We hooked and lost many, and landed several before they became bored and headed elsewhere to spawn or whatever.

Where and when are cutts, you ask?

I have spent many man-hours searching the estuaries and shorelines, on all the tides, in all weather. Many fishless days have accrued, but I have a few highly productive moments in memory, and have located a few favorite spots where the cutts seem to be cooperative.

But I won't broadcast these places to just anyone. You'll have to find your own. Search often and patiently, as I did (and still do), for that bonanza beach.

Don't look for me, though, for I'll likely be elsewhere, still searching.


CHAIRMAN'S MEND
(Continued from page 17.)

• Support an about face on steelhead management moving sharply away from hatchery supplementation toward an orientation which emphasizes naturally spawning, wild steelhead populations, and explicitly recognizes, values and protects the genetic diversity and variability, river/tributary specific nature of wild steelhead stocks;

• Adopt a no-net-loss policy of steelhead habitat and commit to an aggressive program of habitat restoration paid for by hatchery and mitigation funds;

• Work to eliminate non-discriminatory mixed stock fisheries in marine waters substituting terminal, discriminatory capture methods;

• Support wild steelhead release regulations while wild stocks recover to levels approximating historic abundance.

None of these proposals will be achieved easily. Wild steelhead need your help. Why not sign on with the Steelhead Committee to work for the implementation of programs to save wild steelhead. The Committee is a group of activists committed to wild steelhead. Like the Marines, we need a few good men (and women) to fight the war. Most of the work to save wild steelhead is grunt work: attending public hearings armed with the facts, insisting that wild steelhead and their habitat receive the protection accorded by the laws (in most cases) already in place.

• Joined with Oregon Natural Resources Council petitioning for protection of Illinois River winter steelhead under the Endangered Species Act;

• Worked with the Washington Wildlife Commission to set up a professional symposium addressing the most urgent steelhead management issues;

• Sponsored with the Wild Salmon and Trout Alliance a public education conference on wild salmon and trout (steelhead) which is developing a salmonid action plan.

Most of these actions require certain filing fees—usually on the order of $150—and/or administrative costs for room rentals, etc. Why not make a special contribution to a separate Steelhead Committee account to help cover these filing fees and administrative costs.

Doing so would help assure that wild steelhead receive the protection provided by existing laws.

Without some financial help and personal commitment of time, from people out there who care, there may be no reason for Bob to call again, ever.


THE WASHINGTON STEELHEAD SYMPOSIUM
(SEE PAGE 10)

Some of the battles take money. For example, in the past few months, at the Committee's urging, the Federation:

• Joined other conservation groups petitioning for court review of the Northwest Power Planning Council Phase II Fish and Wildlife Program on the basis that the program will do little or nothing this year to increase salmon survival in the Columbia/Snake rivers;
B.C. C & R MANAGEMENT
(Continued from page 17.)

conventional tackle (bait, barbed hooks) to provide brood stock for hatchery programs, only 127 (3.4%) mortalities occurred (Table 2). A large majority of these

<table>
<thead>
<tr>
<th>Stock</th>
<th>Years of Record</th>
<th>Number of Steelhead Angled</th>
<th>Number (Percent) Hooking Mortalities</th>
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</thead>
<tbody>
<tr>
<td>Cowichan</td>
<td>7</td>
<td>509</td>
<td>16 (3.1)</td>
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<tr>
<td>Englishman</td>
<td>5</td>
<td>240</td>
<td>9 (3.8)</td>
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<tr>
<td>Heber</td>
<td>1</td>
<td>70</td>
<td>3 (4.3)</td>
</tr>
<tr>
<td>Gold</td>
<td>1</td>
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<td>Nanaimo</td>
<td>7</td>
<td>378</td>
<td>7 (1.9)</td>
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<tr>
<td>Puntledge</td>
<td>7</td>
<td>481</td>
<td>9 (1.9)</td>
</tr>
<tr>
<td>Salmon</td>
<td>6</td>
<td>464</td>
<td>27 (5.8)</td>
</tr>
<tr>
<td>San Juan</td>
<td>2</td>
<td>49</td>
<td>3 (6.1)</td>
</tr>
<tr>
<td>Somass</td>
<td>7</td>
<td>1174</td>
<td>43 (3.7)</td>
</tr>
<tr>
<td>Tsitsika</td>
<td>7</td>
<td>320</td>
<td>10 (3.1)</td>
</tr>
</tbody>
</table>

| A11       | N/A             | 3715                      | 127 (3.4)                           |


Analysis of the number of steelhead landed per hour fished on each gear combination indicated that bait was approximately 60% more efficient than artificial lure. This figure was probably minimal, however, because a high proportion of the angling sessions commenced with artificial lures and the number of catchable fish was likely much reduced before bait was employed.

The survival through spawning of angled and released Keogh River steelhead was similar to that of steelhead captured at a weir at the same location 400 m upstream from the ocean. The number of steelhead caught immediately downstream from the weir, tagged, released immediately upstream, and later trapped as migrating post-spawners represented 27.5% of the available population.

This was only 5.4% lower than the recovery rate for fish which were not angled (Table 5, page 21). This margin may have been attributable to additional handling stress endured by the angled fish.

Comparison of the degree of hooking injury with mortality rates revealed, not unexpectedly, that mortality was highest among fish which sustained severe blood loss when the hook pierced or tore a major blood vessel (Table 6, page 21).

An instructive feature of the data was that, despite extensive blood loss, 47% of the most seriously injured fish recovered and were released in what appeared to be a healthy condition (Table 6).

Interestingly, while the number of fish in the most severe injury groups (i.e. categories 2 and 3) was small, their recovery as post-spawners did not differ substantially from the least injured fish. Again, this refuted claims that caught and released steelhead were effectively lost from the population.

(Continued on page 21.)

<table>
<thead>
<tr>
<th>Year</th>
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<tr>
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<td>BB</td>
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<td>48</td>
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<tr>
<td>1986</td>
<td>51</td>
</tr>
<tr>
<td>1985 + 1986</td>
<td>99</td>
</tr>
</tbody>
</table>

* BB = barbed hook, bait
BA = barbed hook, artificial
NBB = barbless hook, bait
NBA = barbless hook, artificial

TABLE 3. NUMBER OF STEELHEAD CAPTURED ON VARIOUS TERMINAL GEAR TYPES, KEOGH RIVER HOOKING MORTALITY STUDY, 1985 AND 1986.
STEELHEAD HABITAT
(Continued from page 5.)

...tion that may translate to increased fish growth, particularly in the wetter parts of the Northwest. In other cases, removal of overhead cover can allow a stream to be heated above suitable temperatures for fish, causing stress and death. Kingfishers may perch on overhead cover, from which they catch young trout and salmon; in this case the value of overhead cover is dubious.

From snorkeling observations, my impression of the value of overhead cover to young steelhead is that it is minor until it dips into the water to create instream habitat.

Instream cover provides hiding places, breaks the force of the current, and visually isolates individual fish, thus allowing more territories in a smaller space. Large, dense in-stream cover objects, such as boulders and large pieces of wood, control hydraulic action of water, sometimes causing local scouring of pools, bank undercutting or deposition of gravel or other bedload.

These secondary effects of instream cover objects may be as significant as the cover itself. When the steelhead parr, along with a few bull trout, coho and chinook fry, are congregated in a hole under a log jam in the Dungeness River, is it the cover or the pool that attracts them? Surely it is the combination.

Turbulence cover reaches its purest form in the foam plumes of cascades in plunge pools. One spring in Morse Creek I snorkeled within arm’s length of an adult steelhead hiding in the swarm of bubbles below a small waterfall. I have encountered other large fish, including the largest Dolly Varden I’ve seen while snorkeling, in similar locations. Large fish will seldom let a swimmer approach so closely unless the fish is in its most protected spot.

The extent of foam plumes on plunge pools is a key element in Department of Wildlife measuring methods for determining how much flow is needed in a stream to protect fish habitat.

Deep water is effective cover for large fish whose most likely predators come from above. Find a deep pool and you’ll often find larger fish. Deep water is an early victim of poor watershed and streamside management. The loss of large logs and rootwads from streamside and alluvial from unstable hillside and banks contribute to filling in of pools.

Spawning Habitat. Spawning gravel gets all the attention from salmon biologists; for some salmon species spawning habitat is the freshwater limiting factor. Steelhead, which usually spend two or more years in a stream before going to sea, have ample spawning habitat in most streams.

Exceptions may be in some steep bedrock canyons near the upper limits of access for sea-going trout. For those reaches to produce steelhead they must be seeded by local spawning because no displaced fry or parr can drift from upstream to fill any vacant habitat. Young fish from more abundant spawning habitat in alluvial areas downstream may be unable to swim upstream to fully seed the upper canyon habitat.

Adult steelhead spawn in the spring. Some begin spawning as early as December and fresh redds (nests) can sometimes be found as late as early July. Most wild winter-run steelhead spawn in April and May, while summer-run fish spawn a little earlier, on average.

Hatcheries have used early spawning adult fish to squeeze two summers of growth for their progeny into one; but some wild fish spawn early, too. There are probably seasonal differences in spawning timing between populations. Seasonal differences in spawning time are partly influenced by the home stream environment.

Steelhead spawn in gravel up to 6" in diameter, although they tolerate some larger cobble in the mix. Some deep water or other form of cover is usually close enough to the redd so that spawning adults can escape predators.

Redds must be flushed with water flowing through the gravel during the incubation period, which can last into early August. Water must move through the gravel past developing eggs to wash away waste products of metabolism (e.g., CO2, ammonia) and deliver oxygen to the eggs.

The incubation period generally a time of receding streamflow (except in some streams having high elevation headwaters where snowmelt is late).

Steelhead need to spawn in parts of a stream that will remain watered throughout the incubation period. They increase the chance of successful incubation by spawning in swiftly flowing water (1 foot per second [fps] up to at least 4 fps) in a depth of at least 6 inches.

Food supply. Young steelhead feed mainly on insects and other aquatic invertebrates. These may either be produced in the stream (allochthonous) or fall in from outside the stream (allochthonous). Current can be important for moving invertebrates (drift) from areas where they are produced, or fall in, to where the fish are.

Instream flows are important for insect production as well as for fish habitat. It takes time for aquatic insects to re-establish themselves after areas of stream have been dewatered. Light can contribute to algae production (primary production) which supports aquatic insect production, so that there may be trade-offs between insect production and temperature. Overhanging vegetation may block light, keep temperature down, but may also be a source of terrestrial insects.

Habitat protection. We’re still learning what is important about habitat. One thing we’re learning is that almost nothing is unimportant.

What has been learned is being tested in stream habitat enhancement efforts and monitoring the effectiveness of those efforts. Given that we lack a proven blueprint on enhancement or restoration, habitat destruction makes little sense.

Steelheaders know that growing human population threatens much stream habitat. The fate of steelhead fisheries depends on preserving the stream habitat that remains. Political policies determine whether fish and wildlife habitats are preserved.

It follows that steelheaders serious about protecting their fisheries must become active in the political debates and actions over development and growth management.
B.C. C & R MANAGEMENT
(Continued from page 19.)

CONCLUSIONS

1. Catch and release is an effective
mechanism for maintaining angling
opportunity without negatively impacting
stock recruitment.

2. A significant proportion of the
angling public does not participate in
purely catch and release fisheries, especially
in the absence of any organized, advance
promotion of such regulations.

3. Blanket catch and release restric-
tions are not necessary on some relatively
healthy and/or remote wild steelhead
streams (stocks) on Vancouver Island. However,
relaxation of the existing regulation on a small number of streams
would concentrate anglers and increase
harvest beyond tolerable limits, thus
recruiting the circumstances which demand
Catch and Release initially. The man-
agement strategy on these exceptional streams
must therefore be rigidly enforced.

4. Catch and release management of
wild steelhead stocks will become an
increasing biological necessity in British
Columbia as competing user groups
strengthen their claims to the resource, as
the stream habitat base is eroded by the
inexorable forces of population growth and
resource development, as angler
efficiency increases, and as lobby pressures
demand. The Fish and Wildlife Branch
will be required to play an advocacy role
in this evolutionary process.

WHO SPEAKS FOR SALMON?
(Continued from page 13.)

Our greed and arrogance, unfortunately,
have grown faster than our ability to understand these complex animals. We
need to put the brakes on, or soon we may
regret it. It is time for fisheries biologists
to slow down and rethink the whole
salmon management program in this state,
to place more emphasis on natural produc-
tion and far less on the artificial hatchery.
(Continued on last page)

<table>
<thead>
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<th>Year</th>
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<th>NBB</th>
<th>NEA</th>
<th>ALL</th>
<th>BB + NBB</th>
<th>BA + NEA</th>
<th>BB + NBB</th>
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TABLE 4. NUMBER (PERCENT) OF HOOKING MORTALITIES ON VARIOUS TERMINAL GEAR TYPES, KEOGH RIVER, 1985 AND 1986.

<table>
<thead>
<tr>
<th>Year</th>
<th>HOOK Mort Fish Recovered as Kelts</th>
<th>NHMS Fish Recovered as Kelts</th>
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</thead>
<tbody>
<tr>
<td>1985</td>
<td>25 (22.3)</td>
<td>56 (24.03)</td>
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<tr>
<td>1986</td>
<td>59 (30.6)</td>
<td>403 (34.7)</td>
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<tr>
<td>1985 + 1986</td>
<td>84 (27.5)</td>
<td>459 (32.9)</td>
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<table>
<thead>
<tr>
<th>Hook Injury*</th>
<th>Fish Landed</th>
<th>Hooking Mortalities (%)</th>
<th>Potential Spawning Population</th>
<th>Number (Percent) Post-Spawners Recovered</th>
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<tr>
<td>1</td>
<td>257</td>
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<td>2</td>
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<td>3</td>
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<td>A11</td>
<td>336</td>
<td>17(5.1)</td>
<td>305</td>
<td>64(27.5)**</td>
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</table>

* 1=Superficial wound, no blood loss
2=Moderate wound, some blood loss but no major blood vessel ruptured
3=Severe blood loss associated with rupture of major blood vessel
** Includes 22 HMS kelts which had lost tags.

TABLE 6. NUMBER (PERCENT) OF HOOKING MORTALITIES AMONG STEELHEAD OF VARIOUS HOOK INJURY CATEGORIES AND THE PERCENT OF INDIVIDUALS OF EACH CATEGORY RECOVERED AS EMIGRATING POST SPAWNS, KEOGH RIVER, 1985 AND 1986 DATA COMBINED.
WHO SPEAKS FOR SALMON?
(Continued from page 21.)
ies are no panacea as a past director of the Department of Fisheries once said. It is time to protect the few remaining natural salmon runs that we still have and start on a new management path.

There are many fisheries biologists who work for salmon management agencies that daily carry out practices that they know are contrary to what is biologically best for natural salmon populations. Yet to speak out in opposition would bring down on them the wrath of their superiors. Eventually apathy prevails and it becomes easier to look the other way. The Catch-22 is to do what we know is ethically right for this resource—that which we were supposedly trained to protect.

We have created a monster, I fear, the hatchery-monster that demands to be fed, while we are feeding it, more and more natural salmon runs are disappearing. Soon we will see many more salmon runs listed as threatened for extinction both in the Columbia River and maybe even closer to home. So what should we do about the dilemma?

My solution is to create one salmon management agency, covering all seven species, and make all management decisions based on what is biologically best for the natural runs, rather than what is economically and politically expedient at the moment.

This will require the eventual elimination of all the hatcheries and related practices that negatively impact our natural salmon populations. There should be a moratorium of several years on consumptive commercial and sport fishing on natural salmon stocks. And we must begin the restoration of our stream and river habitats.

It is critical that this question, Who speaks for our salmon?, be answered in our universities with a more biologically-sound form of education for future generations of fishery biologists. And these biologists could use some support from their all-knowing political leaders. Such measures might seem radical but extreme problems need extreme solutions. Such changes can some day bring about the restoration of our natural salmon resources.