

OREGON WILDLIFE

JUNE 1982

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Cover — Private aquaculture began in Oregon nearly a decade ago. While companies still struggle to make it a profitable venture, controversy continues over the concept of privately owned salmon "ranches."

Photo by Jim Gladson

HUNTER EDUCATION PROGRAM	
INSTRUCTORS APPROVED	
Month of April	23
Total Active	1,483
STUDENTS TRAINED	
Month of April	584
Total to Date	291,876
HUNTING CASUALTIES REPORTED IN 1982	
Fatal	0
Nonfatal	5

THE BOTTOM LINE

At a recent annual meeting of the Oregon Division of the Izaak Walton League we heard a speaker who gave us cause to reflect.

At the noon luncheon, Russell Sadler who writes a column for a number of newspapers in the state and also appears on radio and television, was billed to speak on, "Reporting Conservation News." We have talked on the telephone with Mr. Sadler on several occasions, but had not had an opportunity to meet him in person or to know what approach he might take on the topic that was listed. We could have ended up hearing about the ineptness of the various resource agencies in the eyes of the media. We could have had a "60 Minutes" type exposé on a conservation subject or the talk could have just been the ramblings of a newsman who had a bunch of interesting stories to tell.

But none of the above was true, and we were pleasantly surprised. Sadler did not talk about the headlines on conservation of wildlife, but instead about the bottom line. All too often, the only things that get attention in the media are the spectacular and the cute when it comes to wildlife and fish. If thousands of fish are killed, a little curly-haired girl has a pet whatever, an endangered species lays an egg, or a bear wanders down Broadway, it gets reported. And we cannot really say this sort of thing should not get attention. These things are interesting, capture the imagination and often give headline writers a chance to exercise their most creative efforts.

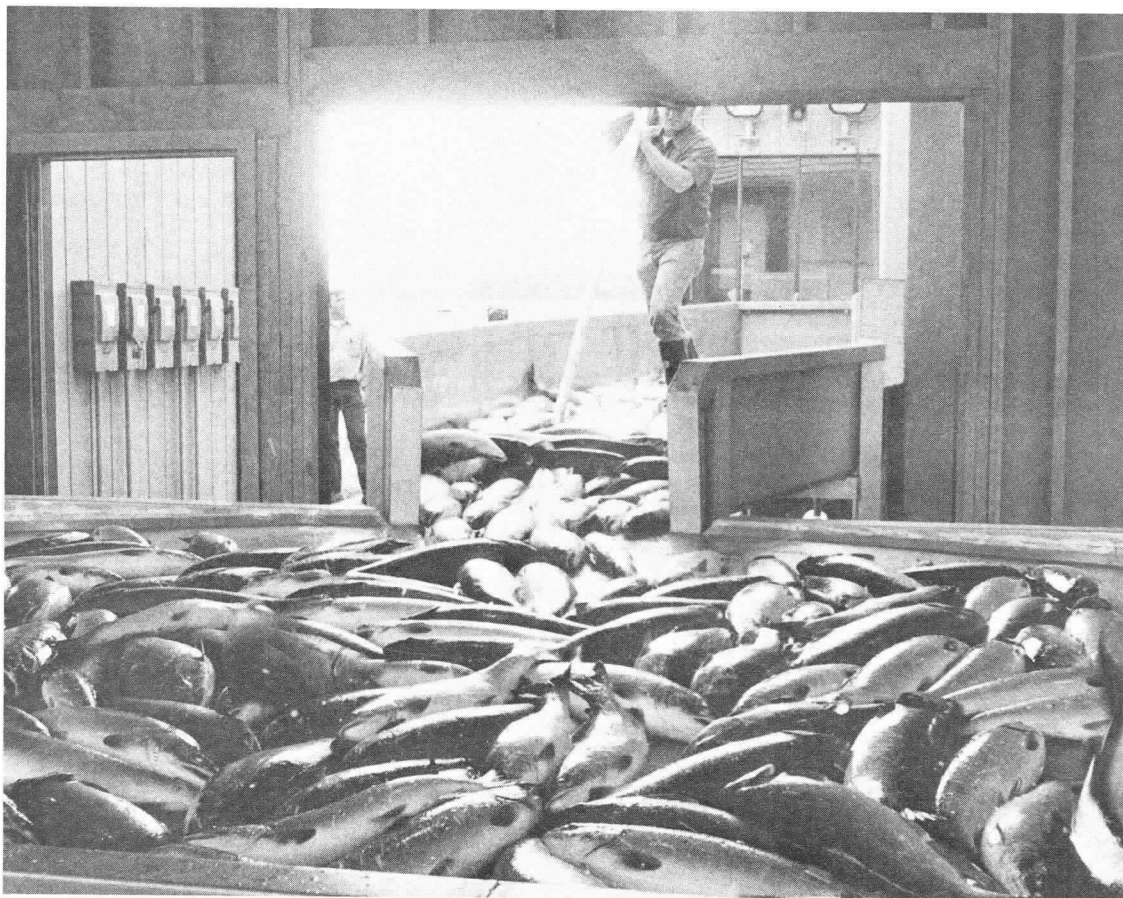
However, in his talk at the League, Sadler devoted most of his time to the subject of habitat. To this writer, this was a most pleasant surprise. Spectacular things happening to individual animals make headlines. And spectacular things happening once to masses of fish and wildlife make the headlines. But the bottom line for the survival of all species is habitat. The destruction of important habitat for wildlife is taking place around us every day in many ways, but it is not spectacular and hence does not usually make the headlines. The filling of a marsh, the culverting of a small creek and elimination of a patch of cattails, the paving of a patch of brush or the clearing of a fencerow bring little outcry and have little human interest for a front page story. Usually they occur with little fanfare. But when it comes to the survival of everything from elephants to shrews or salmon to salamanders, habitat is the bottom line. Without it, all of the zoo breeding of species, restrictive harvest laws and publicity campaigns to save the whatevers will be to no avail! A suitable supply of food, water and shelter still is the key to fish and wildlife survival.

Unfortunately, the plight of habitat will probably never make the headlines. We were most pleased when one of our better known journalists decided to take on the subject and remind people that indeed, habitat is the critical piece of the puzzle in retaining fish and wildlife for the future.□

R.E.S.

COMMISSION MEETING

The Fish and Wildlife Commission will meet on Friday, June 18, at 8 a.m., to consider 1982-83 furbearer regulations and to conduct a general business meeting. The meeting will convene at Fish and Wildlife Department Headquarters, 506 S.W. Mill Street in Portland.□



While this may look like a lot of fish, it is not enough yet for this private operator to turn a profit. While return percentages are increasing, they have still not reached what operators consider a break-even point. Photo courtesy of Oregon Aqua Foods.

OCEAN SALMON RANCHING PRIVATE AQUACULTURE IN OREGON

by Jim Gladson

Oncorhynchus keta is the scientific mouthful of a name for the chum or dog salmon. In the early days of Oregon's commercial fishing industry, when gillnets were used in coastal bays and rivers, this fish was a heavy contributor to the catch.

Eventually nets were outlawed in all but the Columbia River. By then, however, the chum had fallen on hard times. For a variety of reasons, the fish runs had declined to only remnant returns on several north coast streams.

This passing was not heavily mourned. To sport anglers the

chum was always the poor relation of the salmon family. It did not bite well on hook and line and the flesh quality was considered inferior to chinook and coho.

Chum did not jump at commercial trolling lines in the ocean either. And the paler flesh gave the fish a reduced market value. But salmon is salmon and chum did have some value if they could be harvested efficiently.

In the late 1960's, Bill McNeil, then a fisheries professor at Oregon State University, had an idea he felt could bring the chum back.

He began a search for a stream

that still had a native chum run where returning adults could be trapped. He envisioned taking the eggs and incubating them at streamside in specially constructed hatch boxes instead of in a formal hatchery setting.

Chum were well-suited for this approach because, unlike coho and chinook, they do not require a lengthy stay in fresh water before migrating to sea.

The eggs could be hatched then released into an estuary as fry or fingerling, a process that would take a minimum of a few months from egg-take to release. The fish

would return as adults after three to five years.

McNeil started the OSU chum research facility at Whiskey Creek in 1968. This small stream flows into Netarts Bay on the central Tillamook County coastline. The Creek had a native run of about 200 chum salmon.

Adult chum were captured that fall as they returned to their native stream. Hatched fry were released during the winter of 1969. The experiment had begun, and coastal aqua-culture had taken its first step.

The Whiskey Creek facility was both a research station and a prototype fish rearing facility that could produce salmon at a low capital cost for equipment and relatively low operating expense.

People willing to invest a little cash and time could, theoretically, take eggs, release fry and then harvest the returning crop for market a few years later. Eggs to start an operation could be available through the Whiskey Creek facility and native fish captured at a chosen site.

Small operators could make a little money on this as a side venture while also helping to replenish the dwindling chum runs.

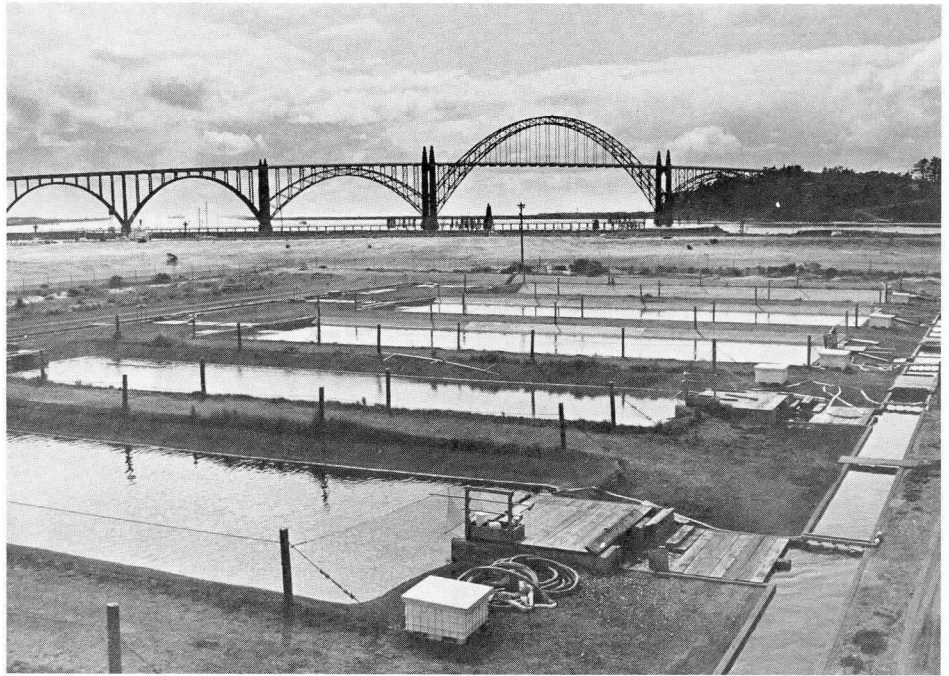
State law stood in the way, however. Only government hatcheries, either state or federal, were allowed to release salmon into State waters.

The 1971 Oregon Legislature took care of that technicality by revising the law to allow private operators to get into the act. The law restricted operators to the rearing and release of chum only. The Fish Commission of Oregon was given overall responsibility for issuing permits and monitoring the operations.

But the glory of the chum salmon was to last only until the next legislative session in 1973.

In that year the Legislature expanded the law again to allow the private rearing and release of chinook and coho. Changing the laws also changed the game. Salmon ranching, as the practice came to be called, was no longer a small-time operation.

Release sites were restricted to some estuaries or lower rivers flow-



The Oregon Aqua Foods release and return facility on Yaquina Bay is the final stop-off for millions of salmon smolts before they are released into the estuary.

ing directly into the ocean, but the inclusion of coho and chinook dramatically altered the earlier vision of a small, self-contained stream-side site to handle the entire incubation, rearing, release and return cycle.

As mentioned earlier, coho and chinook require lengthy stays in fresh water before they reach the smolt stage and are able to migrate to sea.

So not only were estuarine release and return sites needed, but also separate facilities to incubate eggs, then hold the small fish sometimes for a year or more.

With extended holding comes the same problems faced by public hatcheries: feeding, grading, disease control, full-time maintenance, and transportation of fish.

The biggest requirement, for even a small-scale operation, becomes money — lots of it.

BIG MONEY MOVES IN

Shortly after the law was passed, large corporations and private stockholder companies began buying into the salmon ranching business. Although specific figures are confidential, the best estimates put this dollar investment at well over \$40 million to date.

Bill McNeil is now manager of Oregon Aqua Foods, the largest private operator and a subsidiary of the Weyerhaeuser Company, since the timber company bought the operation in 1975. He says he did not foresee such a rapid rush into the salmon ranching business.

"I felt that chum fit a unique niche in that they were historically a fish that was harvested with gill-nets in the coastal bays.

"My outlook was that it was a very depressed resource and that if anything could be done to bring it back, well then the ranching concept fills a void.

"But with coho and chinook, I guess at that time at least, my feelings were that because of the cost of rearing them in hatcheries, it was unlikely that they would become attractive candidates for private investment.

"But I was wrong," he said.

McNeil was not the only person caught off-guard. As corporate investment and production levels increased, members of the traditional ocean commercial fisheries, namely salmon trollers, began to feel they were under siege.

With the small businessperson's inherent fear of large corporations,

many fishermen cried "foul." They predicted severe economic impacts on the salmon fishing industry, undue corporate political influence on state policies, and possible damage to already troubled coastal salmon stocks.

The Oregon Department of Fish and Wildlife, formed by the 1975 merger of the Fish Commission of Oregon and the Oregon Wildlife Commission, regulates the industry. The Department knows it has "a tiger by the tail."

The economic and political issues are troublesome enough, but over it all hangs a scientific cloud. Is the release of these millions of privately-reared salmon hurting or helping the general salmon resource and the industries and people that depend on it?

There are many differing opinions and theories among fisheries managers and other interested people, but no one claims to have solid answers.

This uncertainty prompted Department biologists to ask the Fish and Wildlife Commission to put a hold on the issuance of any more private hatchery permits. In 1980, the Commission agreed and set up a permit moratorium in force until 1985.

In terms of scientific research, five years is a very short time span. Biologists concede that, at best, the moratorium will give breathing space while scientists monitor the fisheries and fish runs. Real answers to the hard questions would take many more years and lots of money.

THE COMPANIES

The following list gives an overview of the 13 companies operating on 20 separate permits for the rearing and release of salmon.

Of the group, only Oregon Aqua Foods has reached a production level for coho. None have approached the release limits allowed them for chinook or chum.

Only the sites used for salmon release and capture are included here since some chinook and coho operators have several freshwater rearing facilities located throughout Western Oregon.

OREGON WILDLIFE

LIST OF COMPANIES, LOCATIONS & PRODUCTION LEVELS

NAME	LOCATION	1981 RELEASES		
		Coho	Chinook	Chum
A. Manseth & J. Jaqua	Nehalem Bay	—	—	650,000
Alfred Hampson	Sand Lake	—	—	—
Anadromous, Inc.	Coos Bay	899,122	790,328	—
Burnt Hill Salmon Ranch,	Burnt Hill Cr.	—	938,600	—
C Heckard	Coos Bay	—	—	—
C. Harris & D. Hugie	Tillamook Bay	—	—	—
Ceratodus Fisheries	Siuslaw R.	—	—	—
Domsea Farms	Siuslaw Bay	157,680	33,662	176,000
Keta, Inc.	Sand Lake	—	—	1,413,000
Oregon Aqua Foods, Inc.	Yaquina & Coos Bays	22,795,606	493,130	3,179,589
R. Stricklin	—	—	—	—
Siuslaw Fisheries, Inc.	Siuslaw R.	—	—	110,000



Burnt Hill Salmon Ranch on Oregon's south coast releases salmon directly into the Ocean via a small stream that flows across the beach.

IS AQUACULTURE GOOD BUSINESS?

Individuals and corporations were quick to put money into the ocean salmon ranching business. But the behavior of their product, salmon, closely parallels the dollar flow.

A lot of money has been put out, but very little has come back. Profit or loss is tied to the return of salmon to their point of release. So far those returns have been, at best, disappointing.

Investments have not yet begun to return money. In fact, operating losses are consuming even more. Ownership of some operations has changed hands since the original permits were issued.

Current economic hard times and high interest rates have further complicated the issue to the point one can only wonder why the money was invested in the first place.

Jim Lannan, Associate Professor of Fisheries at OSU's Marine Science Center in Newport, has one answer.

"It's speculation. If you add up columns of figures and count paper fish, it does look very good," he said.

McNeil concurs.

"On paper, if you are willing to make some assumptions that the fishery will be regulated to conserve natural stocks then you will have excess escapement back to

the hatcheries.

"If you are also willing to assume that the marine survival rate will be between five and 10 percent, well then you combine those two factors together and you get enough surplus fish escaping the fishery back to the hatcheries to pay the cost of hatchery operation, plus, leave some opportunity for profit," he said.

But reality has not lived up to the paper according to McNeil.

"At this point it is struggling. The assumptions on exploitation rates I don't think have yet been satisfied, and certainly our marine survival has been lower than five percent.

"There's a human tendency to say 'Hey, I can do this thing and I can do it better than previous technologies have demonstrated.' That's a normal human impulse, so we all have to learn our lesson by trying," he said.

While returns on coho have been lower than hoped, they have been improving gradually. Time is the critical factor. Returns on investment have not been quick.

"I personally feel that in the long term as stocks become adapted and we get the kinks worked out of some of the innovative technologies, we're bringing on line that, yes, we've got a good chance," McNeil said.

"While we are making fairly steady progress from the biological standpoint, the rub, of course, comes in satisfying the financial supporters of the program. A long-term start up is what it boils down to. It's going to take a lot of patience and a fair amount of money," he said.

Lannan, who took over at Whiskey Creek when McNeil left OSU in 1972, is also optimistic.

"Technologically, I think things are coming together, given that we sort of had to learn as we went. Most of the private producers are putting out a better quality smolt at this time than they were a few years ago," he said.

DEALING WITH THE UNKNOWN

There are two basic experimental technologies developing in private salmon ranching. One in-



Like many public hatcheries, private operations mark many smolts before release. The clipped fin and tiny coded-wire tag inserted in the snout of each smolt allows biologists to determine ocean distribution and catch of these fish.

volves the quick transition the smolts must make from fresh to saltwater. The other relates to the accelerated growth of young salmon to smolt stage.

Standard public hatchery procedure has been to release salmon smolts into fresh water well upstream from estuaries and the ocean. The smolts are allowed to set their own pace and adjust to increasing water salinity as they migrate to sea.

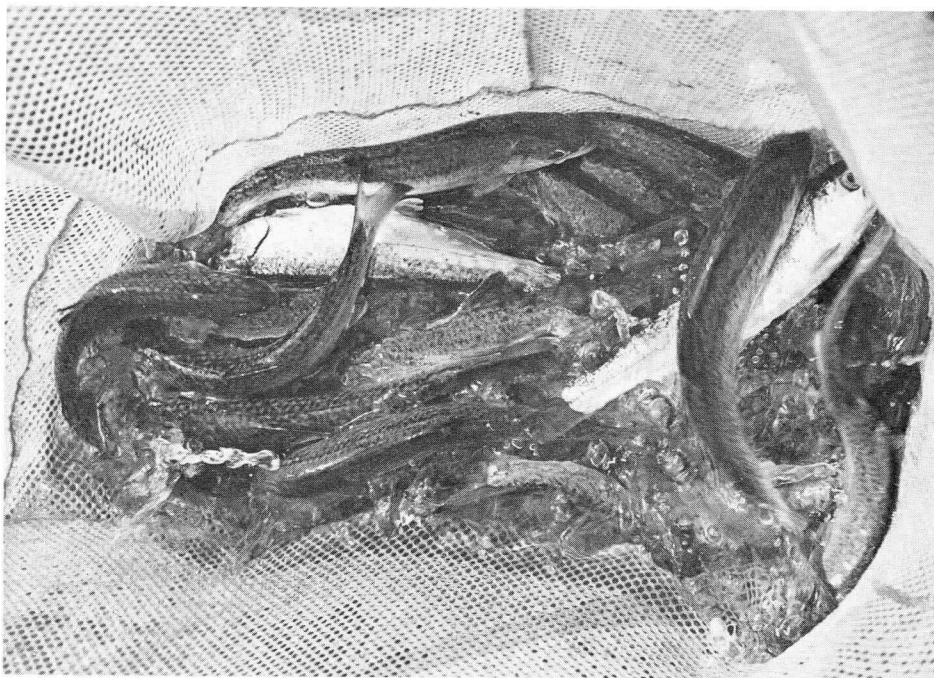
The private operations have no such luxury. The smolts are transferred from fresh water ponds into trucks then hauled to brackish estuarine or near ocean holding ponds. The fish are held in these ponds for a short time to allow them to adjust to saltwater and

imprint on these waters as the place they should seek when returning as adults.

Oregon Aqua Foods, interchangeably known as Ore-Aqua or OAF, is also committed to raising accelerated-growth coho. These are called zero-age smolts because they are not yet a year old when released.

Ore-Aqua raises these "zero's" at their large freshwater facility near Springfield. The hatchery draws water directly from the McKenzie River and mixes it with warm water generated by the nearby Weyerhaeuser Company mill.

The increased water temperature, coupled with special feeding and grading programs, encourages the coho to grow faster. In-



These yearling coho smolts are ready for release into the sea. Private hatcheries will release nearly 24 million coho this year.

stead of holding the fish for 15 months or more and releasing them as yearlings, as do other private and public hatcheries, Ore-Aqua releases fish within seven to nine months after they are taken as eggs.

Both saltwater release and accelerated-growth have caused problems. Ocean survival and returns have been low. Although OAF is at production level for coho, the system could still be considered experimental as the company strives to master the techniques.

The new methods have also left the company open to charges by critics that their system is producing inferior fish.

McNeil feels the practices are beginning to prove themselves.

"The innovative technology is showing considerable promise in terms of being able to bring good quality fish back from the ocean. These are fish that are basically equivalent to troll-caught, quality-wise," he said.

THE FOREIGN IMPORTS

Rearing and release methods are only part of the challenge, however. A key factor in the production process, without which there would be no production, is eggs.

When the private firms started

gearing up their operations after the 1973 law was passed, all parties involved assumed that eggs could be provided from surpluses at public hatcheries.

Plentiful coho returns had allowed the Department of Fish and Wildlife to distribute eggs that were surplus to public hatchery production needs. However, this additional demand for surplus eggs came at a time when coastal coho returns began to decline.

Surpluses became shortages and the private hatcheries were faced with a lack of locally adapted egg stocks with which to maintain their operations.

To get started, the hatcheries had to have enough eggs to produce sufficient smolts for release that would, in turn, come back to the hatchery and yield more eggs to continue the cycle.

The Department cupboards were nearly bare, so the companies were allowed to import chum and coho eggs from outside the state, mostly from the Puget Sound area of Washington.

This practice was continued until 1980. Ore-Aqua now has enough returning coho to meet its own egg needs. Other operators are also getting a large share of their eggs from their own returning fish.

But the fish, primarily coho, now supplying the eggs owe some of their genetic heritage to the out-of-state imports rather than local stock.

Again, controversy surrounds the wisdom of allowing non-native fish access into the Oregon coastal system. Critics assert that the rearing techniques and use of imported stock produce a fish that strays into other coastal streams causing unknown genetic changes to local salmon.

Harry Wagner, Assistant Chief of the Department's Fish Division, says Fish and Wildlife biologists share these misgivings.

"We have a concern . . . I don't know that we have a problem, but we have a concern about the genetic makeup of their fish. That is why we want them to use local stock unless evaluation shows otherwise. There is some experimental basis to believe that their survival will be better from local stocks. If they used local stock, we would have less concern about the straying and possible interbreeding.

"When you introduce foreign genes into a gene pool it is debatable whether you are going to get benefits from hybrid vigor or whether the fish produced are going to be less efficient in using the local stream, and have reduced survival because they are not as well adapted. Right now straying and potential inbreeding is being debated as to whether it is good or bad," Wagner said.

The Department is attempting to introduce more local stock into the private hatchery salmon either by supplying appropriate Oregon fertilized eggs or by "outcrossing" which means fertilizing existing eggs from private hatchery stocks with sperm from public hatchery stocks.

"We have a legal responsibility to assist private hatchery operations in obtaining eggs for brood stock. This can be done by allowing the import of eggs or trying to make eggs available from our own hatcheries or wild stocks in some cases," Wagner said.

"I don't like the term obligation, but we have some responsibility. The legislature didn't establish the law creating private hatcheries for

us to sit back and not provide eggs.

"I believe we have an obligation to help them develop their broodstocks. We have a responsibility to do that in a way that protects the resource. That can best be done by providing appropriate eggs to get these folks the best possible broodstocks from wild and/or public hatchery stocks," Wagner said.

Some aquaculture opponents have frequently berated the transfer of eggs to private firms. Critics feel that more eggs should be used within the state system or given to citizen volunteers within the Salmon Trout Enhancement Program (STEP).

When surplus eggs are available, they are distributed or sold by the Department according to a written priority list.

State programs, including STEP, receive first priority. Private hatcheries are fifth on the list after in-state federal hatcheries, state and federal hatcheries in the Columbia River system outside Oregon and educational uses.

According to Wagner, everyone has a stake in the brood stocks private hatcheries use.

"We are concerned about the brood stock they use because they potentially will be the predominate coho in the fisheries," he said.

In 1982, private hatcheries will release about 24 million coho between May and September. This figure is almost twice the number of coho released from Oregon's public hatcheries.

However, in the view of some fisheries biologists, releasing more fish into the ocean is not necessarily a good idea.

TOO MANY FISH — NOT ENOUGH SEA?

Scientifically, the theory is known as density-dependent mortality. In simple terms, this means that the ocean can only feed so many fish. If too many fish are released and forced to compete for limited food and space, then death rates will increase.

Since the mid-1960's hatchery production of coho smolts has increased while actual returns of adult fish, which were initially very good, have fluctuated and

Page 8



Commercial salmon trollers have complained that privately-produced salmon are smaller than public hatchery stock. Statistics show this is true, but the fish size is increasing gradually each year. Photo courtesy of Oregon Aqua Foods.

then declined in recent years.

The five-year hold on new private hatchery permits was instituted partially in response to this problem.

So another scientific question is added to the list of unknowns. As with the issue on genetics, biologists are divided on the effects private hatchery fish may have in the ocean. They are certainly not entirely to blame, however, since the problem was identified well before any private fish were released.

Scientists are unanimous on one point though. Five years is not enough time to get the answers. Ten to 20 years and lots of money for comprehensive research might provide a better picture, they say.

Unfortunately, the money and manpower are not there to be used. As an alternative, Department biologists have advocated the go-slow approach combined with consistent monitoring of hatchery programs, both public and private, and wild stocks.

USER GROUPS RESIST HATCHERIES

There are just too many questions for some people. Salmon trollers object to private hatcheries not only on scientific grounds but on the potential affects of ocean ranching on the fishermen's wallets.

Jerry Branch, past-president of

the Metro Trollers Association, sees some real concern among his fellow fishermen.

"I would say that 99 percent of the trollers are against private aquaculture. Fishermen fear competition in the marketplace with large quantities of fish being put on the market over a very short period of time. This could tend to force market prices down and create economic hardship," he said.

Even though ocean ranchers put more fish out to be caught by trollers, many fishermen do not see that as an advantage, according to Branch.

"Aquaculture fish are smaller and less marketable. Last year the processors had split prices with different, lower, prices for smaller fish," he said.

Branch says his own opinion is different, but he is worried about the scientific unknowns.

"I feel they (private hatcheries) are entitled to their opportunity to compete, but I do have some concerns about stock transfers. I think they are progressing faster than they should be allowed.

"Many of the scientific issues are not being adequately addressed and all the while private aquaculture keeps dumping out more fish," he said.

Trollers faced with declining salmon returns and shortened seasons are not very willing to live and let live.

This insecure position also gives rise to what Branch calls the "Conspiracy Theory." Essentially fishermen fear that the large corporate interests will be able to influence public policy and restrict fishing on the returning salmon.

Trollers also envision an attempt to get them off the ocean because they fish on mixed stocks of salmon.

The last concern centers on the concept of the so-called "terminal fishery." This commercial fish harvest method would rely almost entirely on the rearing of hatchery fish, that would be taken upon return, then shipped to market.

The system is more like a farmer harvesting a crop, while the troller is sometimes compared to the hunter who must search for his prey.

JUNE 1982

Terminal fishery production and harvest methods are used heavily in Japan and the Soviet Union.

Because of these philosophical differences, "Many fishermen feel that a public and private system can't co-exist," Branch said.

Chuck Voss, Executive Director of the Northwest Steelheaders, says some sport anglers share the trollers' concerns regarding corporate misuse of power and scientific questions. But, on the whole, he sees opportunity.

"If there are some real honest protections through legislation and if the Oregon Fish and Wildlife Commission remains strong and remembers its responsibility to the public, then private aquaculture could make a good contribution by adding to the salmon fishery.

"Speaking for the sportsmen, I want to see as many fish out there as possible. I would like to see the ocean managed so that a guy can go out there in his 17 foot kicker boat and fish for salmon. When guys like that get a fish on, they don't particularly care where it came from," Voss said.

CONTRIBUTION IS THE KEY

There are more fish available in the ocean because of private aquaculture, and more of them are being caught.

In 1981, biologists estimate that privately-reared coho made up about 13 percent of the ocean catch. The 1982 contribution prediction is 24 percent.

Fishermen's claims that the fish are smaller is correct. But that is changing, according to Ed Cummings, the Department biologist in charge of private aquaculture regulation.

Last year, returning private fish weighed-in at an average of about one and one-half pounds smaller than publicly-reared coho. But those fish were also almost two pounds heavier than aquaculture fish returning in 1978.

The size figure is just an average. Cummings notes that coastal biologists have recovered fish comparable in size to public hatchery products.

"Survival is the name of the game for them, and survival in the

ocean appears to be tied to size. So, as they increase the size of the fish at release and zero in on release sizes, they have been increasing the size in the ocean," Cummings said.

Returns to the private hatcheries are also moving up. Last year an average of .70 percent of the fish released as smolts returned as adults. This compares to a .51 percent return in 1980 and a .47 average return in 1979.

The numbers are increasing, but are still quite a distance from the 1.0 to 2.0 percent return acknowledged by some operators as the breakeven point.

The profit-making returns are even farther down the road, if reachable at all. Again, the patience of the financial backers is as big a question mark to the future of private aquaculture as many of the scientific questions.

Private aquaculturists are also making more subtle contributions, mainly in the realm of fisheries research.

Private firms funded about \$78,000 worth of state research including tag recovery and straying studies during 1981.

Private aquaculture's own research is also broadening general fish culture knowledge in such areas as zero-age smolt production, saltwater releases, and hatchery nutrition programs.

Wagner views this as a real asset. "They certainly are advancing the science and art of aquaculture. They are looking at some very innovative rearing and releasing techniques so we will benefit from a spin-off of their fish culture research," he said.

He is also not disturbed by the experimental nature of the work.

"I feel that all hatcheries, public or private, are experimental. They haven't been around long enough for us to say how well they are going to function over a long period of time.

"We've been evaluating Elk River Hatchery (a Department facility on the south coast) since it came on line in the late 1960's. We still don't understand what the long-term success of that hatchery is going to be, for example.

"Aquaculture is still largely an

art. We are still learning," Wagner said.

If it is possible to summarize a subject as complex as private aquaculture, then the most simple phrase would be that the effort is an experiment in unknowns.

These unknowns have promise. They may also have some problems. Those people involved in the industry think the system can produce. Opponents fear success may wreck their own salmon markets, while failure could mean ecological damage to public fish stocks.

The Department of Fish and Wildlife, as regulator, resides in the middle. Not a few biologists, including Harry Wagner, wish they could start the whole process off on a different footing.

"I don't second judge those people back in the '70's that made those decisions in favor of having private hatcheries and allowing rapid growth. They did it with one information base. Now, ten years later, we are sitting here with a different, but still incomplete, information base and experience, and trying to judge their decision as to whether it was good or bad. Which is it? I think it is too soon to tell.

"Obviously I think we would do things differently based on ten years of experience. I think we would be more conservative about releasing so many fish and make a greater effort to try to get eggs from local stocks than we did earlier.

"We talk about controlled growth, but, in my opinion, we have grown too fast.

"Private aquaculturists are a user group. As a user group the agency tries to be responsive to their needs. Just like we try to be responsive to the needs of trollers, the charter boat operators, the individual recreationalist, the fly-fishing enthusiasts, etc. We look at ways to try and accommodate their concerns and their interests and protect the resource at the same time.

"Private hatcheries are another user group, pure and simple. But they are a unique group because they have the potential to become a very important part of the production system," Wagner said. □

PEREGRINE EFFORTS CONTINUE

by Ken Durbin

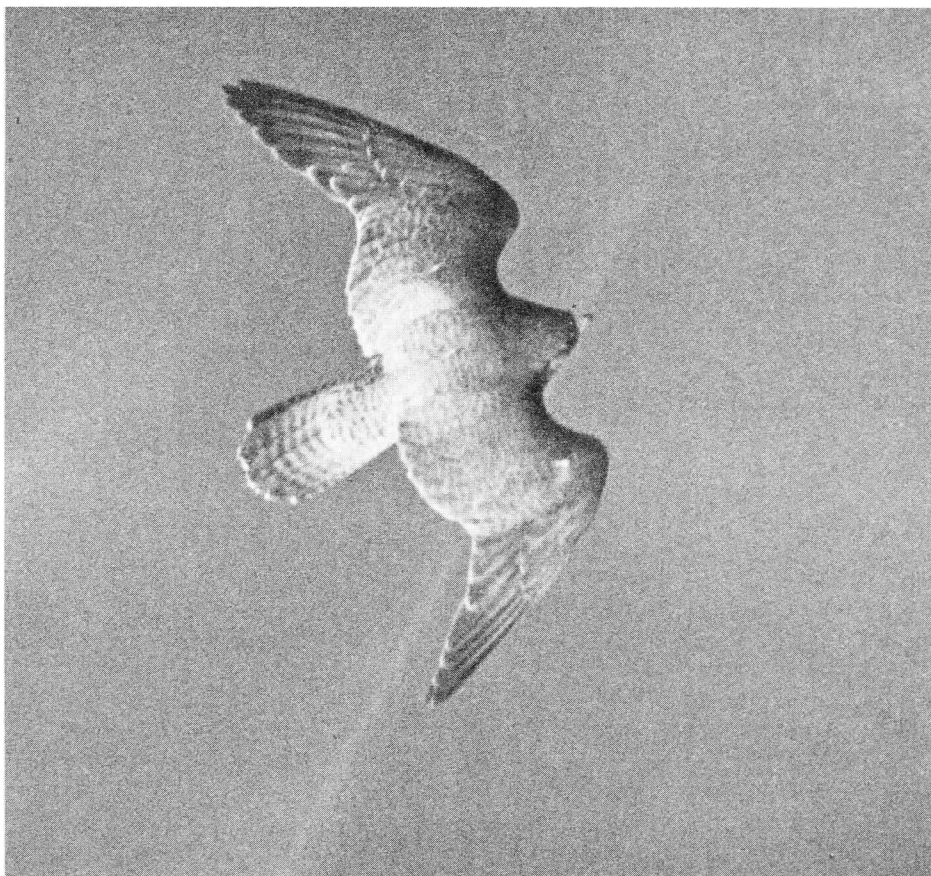
It's not nice, they say, to fool Mother Nature. But when extinction is the alternative, subterfuge may be the only key to survival.

Guided by that philosophy, some sneaky efforts have been undertaken to insure that the peregrine falcon, Oregon's rarest raptor, does not disappear from the State. But not even clandestine operations, fanatical devotion, and hard work on the part of some individuals and public agencies, will insure success without a healthy measure of luck.

The peregrine falcon is on the brink of nonexistence in Oregon. Where there were 39 known peregrine nests in the 1930's, today there remains only one known active site. And the pair of birds that use it have had only marginal reproductive success the last few years.

The peregrine story has been one of decline throughout its range in the northern hemisphere with most of the loss taking place since the mid-1940's. Although some decline is attributed to changing climatic conditions, the drop in peregrine numbers has been largely due to reproductive failure, and this is tied directly to use of the pesticide, DDT. Residues of DDT, and its breakdown products, DDE, DDD, and others, rapidly spread throughout the world after the chemical came into widespread use in the mid-1940's. This contamination has been found to cause eggshell thinning and reproductive failure among a number of bird species, including the peregrine falcon.

Eggs with thin shells are more easily broken or damaged than normal eggs, but an even more serious problem is the dehydration that takes place through abnormally thin shells, causing embryos and developing chicks to die before hatching. The problem is widespread, and peregrine numbers dropped so low in the United States the species was given full federal protection under the En-



An adult peregrine wheels angrily nearby as workers visit the nest.

dangered Species Act of 1973.

Peregrine falcons never were abundant in Oregon but at one time they were fairly common in many parts of the State. Historically they nested on our coast, along the Columbia River downstream from the Dalles, in the Cascades and at a number of sites in eastern Oregon.

Today, Crater Lake National Park is the site of Oregon's only active nest. Although the species has been known there since the late 1800's, only sketchy information has been available about numbers and nest locations.

In recent years, more attention has been paid this spectacular bird. Young were fledged in the park in 1975, and one peregrine was seen in late summer of 1977. In 1979 a pair of birds were seen and their nest site was located. It was found on a ledge below a cliff

overhang and it contained two fledged young.

After the birds had left the nest, park personnel descended to the site and found that the birds had laid a third egg which failed to hatch. In 1980 the birds returned again and three eggs were laid, but none hatched.

All four unhatched eggs (from 1979 and 1980) were collected by Park Service personnel and were sent for analysis to the US Fish and Wildlife Service. Verdict of the analysis: Thin shells, characteristic of those from failed peregrine nests elsewhere. Analysis of the egg which failed to hatch in 1979 in fact, indicated it was lucky that the other two eggs had survived.

Since the egg analysis indicated a high potential for continued reproductive failure, a plan was needed to insure future success of the nesting site. Staff from Crater



Rob Roy Ramey of the Predatory Bird Research Group at Santa Cruz, California, rappels to the nest with two captive-reared chicks in his backpack.

Lake Park met with the Department of Fish and Wildlife and the US Fish and Wildlife Service and developed a plan which was implemented in May of 1981.

Biologists, skilled in technical rock climbing, descended on ropes to the nest and removed three eggs, replacing them with two newly-hatched chicks. The young came from captive-bred birds at the Predatory Bird Research Group (PBRG) facility at the Uni-

OREGON WILDLIFE

versity of California at Santa Cruz. Eggs removed from the nest were taken back to the PBRG facility where they were specially treated with wax to prevent dehydration. Two were hatched in mechanical incubators. But the third was found to be dead.

After hatching, the shells were checked for thickness and sent to Bodega Bay Institute for analysis. Test results indicated the eggs would have failed had they been

left in the nest. So by manipulating the nest and fooling Mother Nature, biologists had been successful in bringing about the successful fledging of two young in the wild, and the artificial hatching of two wild eggs which would have failed otherwise.

The nest manipulation was repeated this year. Again three eggs were laid in the nest. A climber again removed them and replaced them with two healthy chicks. The eggs were placed in a portable, battery-powered incubator and carefully transported to the PBRG facility, arriving a few hours later. But they were found dead, apparently having been so for about a week. Once again, Oregon's only nesting peregrine falcons would have failed to reproduce if a group of biologists had not decided to fool Mother Nature.

The nest manipulation operation has involved high technology, some critical coordination and the exercise of extreme care. This year, observations of the nest began in late March when Oregon State University graduate student Chip Harvey and Park Resource Management Specialist Mark Forbes skied to the site to confirm the birds had returned. Except for a temporary setback because of heavy storms, Harvey has been making daily observations since.

Captive birds at the PBRG facility in Santa Cruz were mated and their eggs hatched to provide the young for the switch. The project was planned to occur after the wild birds had incubated their eggs for at least ten days. This was to insure the adults would care for the young birds after they were placed in the nest. Prior to that, the wild birds may have abandoned a disturbed nest site.

On the appointed day, the chicks were flown from Santa Cruz to Chiloquin, Oregon, by private plane. The pilot has taken an interest in the project and donated his services. At Chiloquin the chicks were met by Park Service personnel and the climbers who would descend to the nest site. Chicks and climbers boarded a helicopter leased by the Fish and Wildlife Department for the 28



Chicks above are given a last meal before being placed in the nest. Puppet fashioned to resemble an adult peregrine helps the chicks to "imprint" on adult birds rather than humans. Below, the chicks perch on the rocky ledge which serves as a peregrine nest.



minute flight to the nest area.

In the meantime, personnel from the Park Service, the Fish and Wildlife Department, and PBRG had traveled by truck, snowmobile, skis, and foot from Crater Lake Park headquarters in order to reach the nest area and make preparations before arrival of the helicopter. Radio communications insured that all activities were coordinated.

The helicopter deposited its car-

go of peregrine chicks and climbers on a flat half a mile from the nest and the chicks were carried by foot to the nest site. Upon learning the helicopter had landed, other personnel approached the drop-over site to rig rappel ropes and safety lines so all would be ready when the chicks arrived.

The chicks were given a final meal, fed by means of a hand puppet fashioned to look like a mother peregrine, and then were placed in

a special backpack. The climber threw his rappel rope down the cliff, flushing the female from the nest, and rapidly made his descent. He pulled himself under the overhanging cliff by means of a fixed line left in position the year before. Eggs were removed from the nest and placed in a special padded container. The chicks were transferred to the bare rock nest ledge.

The peregrine female, meanwhile, took none of this intrusion lightly, screaming and wheeling, and often making plummeting passes within feet of the climber's head. Her mate joined the protest, wheeling above the party and screaming his discontent. As soon as the switch was completed, the climber ascended the rappel rope and the eggs were transferred to a portable battery-powered incubator for the reverse trip to the PBRG facility at Santa Cruz. The actual transfer operation from throwing the rappel rope down, to leaving the site, took 24 minutes.

The intruders had barely departed when both birds returned to the nest ledge. For a few minutes the adults seemed perplexed but soon they seemed to accept this new turn of events. The female began caring for and grooming the young while her mate left, presumably to find a meal for his new family. Chip Harvey will continue to observe the birds daily and guard the site until the young leave the nest.

After much controversy, DDT was banned in the United States in 1972, and since then levels of the pesticide have subsided in the environment. This is encouraging because it means birds like the peregrine falcon may once again be able to nest successfully in this country.

But while the problem has diminished, it has not gone away. Not all countries have quit using DDT and residues from spraying in other parts of the world continue to find their way into the shells of peregrine falcons nesting in the US.

Peregrine falcons feed almost entirely on other birds which they capture in flight by means of blinding attacks from above. They

JUNE 1982

are opportunistic feeders, taking a wide variety of smaller bird species depending on what is most available. Many of these prey birds are migratory, spending part of their year here and part of it elsewhere.

Birds which winter in South America, for example, where DDT is still commonly used, may summer in the US where some of them become prey to falcons. As long as this condition exists there will be continuing problems with peregrine nesting success.

The hope is that as this long-lived pesticide declines in worldwide use, the levels which reach raptors like the peregrine will become smaller and smaller. In some areas of the US, peregrines may feed on a greater percentage of resident birds and so receive smaller levels of DDT contaminants than others which eat larger numbers of migratory birds. In the meantime, efforts continue to insure survival of the peregrine until conditions for its comeback improve.

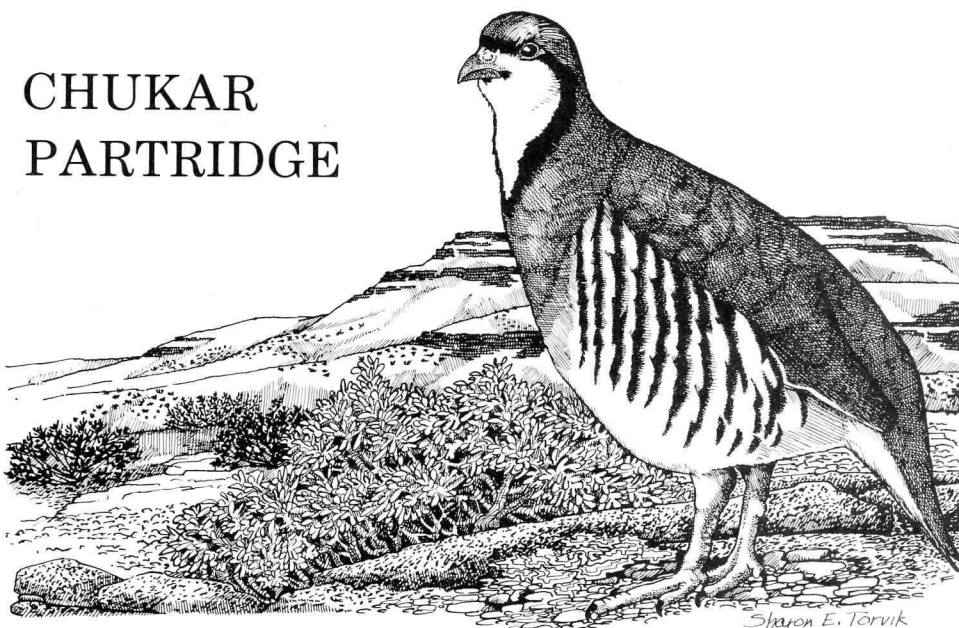
The costs of work like this, as might be expected, are not small. Expenses incurred so far have been shared by a number of agencies and individuals. But Oregonians, who contributed to the Non-game Wildlife Fund during the last three years, by checking off a donation on their state tax form, have helped pay for a good share of the work.

Another project is scheduled this summer, aimed at reestablishing peregrine nest sites along the Oregon coast. The birds for this effort will come from captive-bred sources, and will be weaned back into the wild through a process known as "hacking". It is hoped that these birds will survive through the year to reoccupy historic nest areas in future years.

Man for good or ill, has always had an impact on his environment. It was man's activities, through the use of pesticides, that unintentionally led to the decline and fall of the peregrine falcon throughout this country. And it will only be through man's continued determination and effort that this condition can be reversed so that it may no longer be necessary to "fool Mother Nature". □

OREGON WILDLIFE

CHUKAR PARTRIDGE



Early one September morning in 1951, several trucks pulled away from the Ontario Game Farm headed for the steep rocky slopes of Hart Mountain.

On board, 280 adult chukar partridge were about to receive their first taste of freedom. These birds would soon become the start of our state's most successful introduction since the Chinese ring-neck pheasant in 1881.

Oregon's stock of chukars came originally from the south slopes of the Himalayas in India. However, the birds released in Oregon had all been raised on state game farms. Although some chukars are still game farm-reared for release on hunting areas, most of the state's populations are now self-sustaining.

Chukars are gray-brown in color with some blue highlights on the breast. But the red beak and feet, the black bars on the flanks and the black line running through the eyes like a narrow mask, on down the back of the neck to join on the upper breast, are distinctive in separating the chukar from every other native or introduced species. The only look alike is the French red-leg partridge, still in the early stages of game farm propagation and planned for eventual introduction.

Almost all of Oregon's suitable chukar habitat has been stocked over the last 30 years and good populations are established along the Deschutes, John Day, Malheur, Owyhee, and most other rock-rimmed river canyons in eastern Oregon. Other groups are found on Hart, Steens, Pueblo, Trout Creek Mountains and other isolated areas.

Cheat grass and other vegetation make up the bulk of the chukar's diet although they will also take insects such as grasshoppers when available. During summer months they tend to concentrate near water in coveys of 20 to 200 or more birds, splitting up and spreading over the hillsides when fall rains make moisture more easily available.

Chukars often winter on sunny slopes where snow does not stick for extended periods, although deep snowfall may force them down to lower elevations in search of food.

In early March, chukars begin selecting mates, with nesting beginning in four to six weeks. A chukar nest is usually hidden under a bush or clump of grass and usually contains 10 to 20 brownish, spotted eggs. Incubation takes three weeks.

Young birds are active almost immediately after hatching. By 12 weeks chukar chicks have all their feathers and markings, including the red beak and feet, making them hard to distinguish from full grown adults. □

Bob Kuhn

Page 13

THIS AND THAT

Compiled by Ken Durbin

WILDLIFE USE

SOLAR ENERGY, TOO

Solar technology is still a comparatively new science, and new developments are reported almost daily. Birds, however, have been studying it for a long time.

A zoologist from Ohio State University has studied the behavior of herring gulls, and finds that on a very hot day the birds face directly into the sun, so that the rays hit the smallest possible amount of body surface and are reflected from the white feathers of the breast. On cool days, the birds turn their backs on the sun, absorbing heat through their grey wings. The scientist estimates that they absorb about four times as much heat with their backs turned to the sun.

The gulls also have learned that the more oblique the angle at which the sun strikes them, the less heat they receive, and they continually adjust this angle according to whether they are hot or cold.

Wildlife Review

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MOST DANGEROUS JOB

A policeman is attacked in an urban area, and a wildlife officer is assaulted on patrol. Which officer is in more danger? The wildlife officer is, according to a University of Wyoming study of assaults on law-enforcement officials nationally. In fact, the study found that assaults on wildlife officers are nine times more likely to be fatal than assaults on police officers.

The major difference between enforcing wildlife regulations and other laws is that wildlife officers deal with people who are usually armed, and are often in remote areas. Police are assaulted more often than wildlife officers, but 80 percent of these assaults don't involve deadly weapons such as guns, knives and clubs. Many are just scuffles. In contrast, 80 percent of the assaults on wildlife officers involve firearms.

Page 14

RECYCLE THOSE FEATHERS

Mrs. John Hane of Roseburg sent us a marvelous idea which many waterfowl and upland bird hunting families may want to adopt. Her husband saves feathers from his hunting season success. In the Spring, when the birds are building their nests, she puts them out in her yard around the shrubbery.

"I wish you could see the birds gather these feathers up," she wrote. "My husband would not think of shooting ducks and geese without bringing me home the feathers."

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SELF DEFENSE?

According to the Associated Press, a 27-year-old Phoenix, Arizona man was killed earlier this year when he shot a saguaro cactus. Maricopa County sheriff's deputies said the man fired a shotgun at least two times at the 27-foot cactus. The shots caused a 23-foot section of the huge plant to fall and crush its assailant.

Destruction of cacti is a misdemeanor under Arizona law, but obviously the consequences can sometimes be more severe.

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FOR BLUEBIRD FANS

Are you fond of bluebirds? If so, the North American Bluebird Society would like to hear from you. This organization is dedicated to the conservation of these beautiful songbirds, and offers information on building bluebird houses, methods of improving bluebird habitat, and other subjects.

For more information, write to the North American Bluebird Society, Box 6295, Silver Spring, Maryland 20906.

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55 MPH

Canada geese average about 55 miles per hour during migratory flights. The geese fly in the familiar V-shaped configuration to cut down on wind resistance and often fly non-stop for hundreds of miles.

Illinois

OUTDOOR HIGHLIGHTS

THINK AHEAD FOR HUNTER ED

It's not too early for youngsters who plan their first fall of hunting this year to begin thinking about a hunter education course. The eight-hour course is required of all hunters under the age of 18 in Oregon. The course is taught by more than 1,400 volunteer instructors scattered throughout the state. Courses are held throughout the year, although more will be scheduled between now and the beginning of hunting season than at any other time.

Courses are often advertised in the local newspaper. Oftentimes local offices of the State Police, Sheriff's Department or other law enforcement agency will have information on local courses. If you have difficulty locating a course, the Hunter Education Section of the Department's Portland office can provide a list of instructors for your county so you can inquire.

In the Portland area, information on local courses is available on a recorded message that can be heard by dialing 229-6666. By law, Oregon hunters under the age of 18 must have in possession a hunter education certification card while engaged in hunting.

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POACHING GOES UNREPORTED

By conducting some innovative research on the effectiveness of wildlife enforcement, using undercover officers, the New Mexico Game and Fish Department found that not the estimated five to ten percent, but less than one percent, of deer poaching cases were detected and reported, and that the primary reason was the general public's condonation of poaching.

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JUNE 1982



Oregon's

WILDLIFE WINDOW

Fish and wildlife management is seldom the management of fish and wildlife at all. It is the management of people. Most managers will admit that perhaps 90 percent of what they do is aimed at people management. A majority of the time is spent reviewing what people are planning to do with wildlife habitat, trying to determine how much of the resource is available for people to use, and otherwise trying to get people to interact with wildlife and habitat in a desirable way.

Regulations, the backbone of most fish and wildlife management efforts, are almost all people management in nature. They restrict how many people may use an area, how many animals people may harvest, how and when people may harvest them and whether people may sell or otherwise use the results of their efforts.

Regulations may be either social or biological. The first are ones based on people considerations and have little to do with wildlife biology. The law requiring a youngster to complete a hunter education course before hunting is an example. Biological regulations are designed to benefit or protect wildlife. The eight-inch minimum length for trout in most coastal streams is an example of a biological regulation. In either case it is the first responsibility of the management agency to insure that the resource survives for future generations. The agency's second responsibility involves deciding how various interest groups may use

the resource. Increasing demands and conflicts have managers spending much of their time on the latter.

Fish and wildlife management could be relatively simple were it not for people. Biologists could work to improve habitat wherever needed. They could crop populations or let nature do so depending on what best benefited each species. New species could be transported across natural barriers to suitable habitat that nature had not managed to stock. And, it would not be necessary to set a variety of harvest methods and seasons with all the accompanying restrictions necessary to suit diverse interest groups that wished to participate.

Nothing is simple about real fish and wildlife "management" however. People are everywhere, requesting and doing all kinds of things on nearly every area of land and water. Thus, biologists spend great amounts of time reviewing impact statements, county land use plans and trying to get people activities to conform more closely to needs of fish and wildlife. Regulations get more complex in an attempt to make people less efficient. Roads are closed and areas restricted to give wildlife a temporary escape from people disturbances. Masses of paper gets printed such as the publication you are holding. The purpose is to inform people about wildlife so the resource will get more consideration.

THIS MONTH'S WINDOW

People Management

Get a copy of any fishing, hunting or trapping synopsis. Decide which regulations are biologically based and which are made for social reasons.

Choose some fish or wildlife management activity. List which aspects of that activity are people management and which are wildlife management.

Invite a biologist to your classroom. Find out what the biologist does that is considered biological and what is considered people management.

HAT TIP TO FEDERAL JUDGE

Up until now, our recognition of judges has been limited to the state courts. However, some sound action is taking place at the federal level. Sergeant Steve Shaw of the Oregon State Police sent along the following story which we feel indicates a tip of the sportsman's hat is in order for Judge Dolan.

In a recent civil hearing, Judge Hugh J. Dolan, who is an Administrative Law Judge with the National Oceanic and Atmospheric Administration, handed down two significant penalties.

One involved a commercial fisherman who had landed a Chinook Salmon that was one and one-half inch undersized. The National Marine Fisheries Service proposed a civil penalty of \$150.00 to the fisherman. The fisherman declined the offer and requested a hearing.

After listening to the testimony and arguments, Judge Dolan reentered the following decision:

"I conclude that a civil penalty of \$6,250.00 and forfeiture to the United States of the seized chinook salmon is an appropriate penalty. In arriving at this result, I am not unmindful of the fact that from the outset the agency has sought only a \$150.00 penalty and forfeiture of the fish. I am unimpressed with the agency approach which would allow respondents to treat violations as a cost of doing business."

At the conclusion of his decision, Judge Dolan offered the following footnote for the benefit of those inclined to violate Federal Regulations:

"From newspaper and press releases dealing with the tragic salmon fishery problems and particularly the disposition of Federal District Court Judges in the Northwest to incarcerate violators, I advise affected per-

sons that \$12,500.00 per violation will be the standard starting point. While ability to pay is a factor to be considered in assessing civil penalties, it is not a refuge for violators. Nor do I mean to take sides in regional controversies. The Courts and the Congress have spoken. The law will be obeyed! Those who commit violations will receive substantial penalties commensurate with the need to protect this declining resource."

The second case involved a for-

eign cargo vessel tied up in Coos Bay. The crewmen were crab fishing for personal use and had two live crab and some cooked crab remains when boarded by Federal Agents.

Fishing by foreign vessels, within the boundaries of any state, including the territorial sea (zero to three miles) and internal waters of the United States is totally prohibited.

Judge Dolan imposed a penalty of \$12,500.00□

NEW COMMISSION MEMBER

A Corvallis resident, Jane G. Capizzi, has been appointed to the State Fish and Wildlife Commission by Gov. Vic Atiyeh.

Capizzi will succeed Jack P. Steiwer, Fossil, whose term ends June 30, 1982. Mrs. Capizzi will serve a four-year term beginning July 1, 1982 and expiring June 30, 1986. The appointee is subject to Oregon Senate confirmation.

According to HB 2003, 1981 Legislative session, (effective Nov. 1, 1981) appointments following the 1981 session must reflect representation from each of Oregon's five Congressional Districts. Capizzi will represent the Fifth Congressional District.

Duties of the seven-member commission include formulating and implementing state wildlife management policy. The Commission also oversees enforcement of game regulations by the Oregon Department of Fish and Wildlife.

Capizzi is the president of the Oregon division of the Izaak Walton League of America and served as its vice president, 1978-1980. To avoid any possible conflict of interest, Capizzi will resign her position as president upon Oregon Senate confirmation.

Capizzi is the International 4-H Youth Exchange Coordinator for Oregon. She is a member of the Ninety Nines', Willamette Valley Chapter, an international organization of woman pilots. She has served as 4-H Extension agent for Douglas County, 1953-1958, and for Barnstable County, Mass., 1950-1953.

She received her bachelor of science degree from the University of Vermont, Burlington, Vermont, (1950), and studied at Colorado State University, Fort Collins, Colo., (1952, 1957).□



Jane G. Capizzi



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