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**Guest columnists**

## **Wisely investing in stocks of Pacific Northwest salmon**

**By Mary Ruckelshaus, Nathan Mantua and Robert Francis**

*Special to The Times*

In recent years, local headlines frequently spread the message: "Northwest salmon stage a comeback!" Yet, local and regional salmon-recovery groups continue to meet, develop plans to reform hatcheries, reduce harm from harvest, improve fish passage and restore salmon habitat.

With all of the good news about strong runs in recent years, why haven't scientists and policy-makers simply declared victory and moved on to other activities?

The answer is simple. First, salmon numbers in the Pacific Northwest are incredibly variable over time and across the region in adjacent streams or from year to year in the same stream. Because of this variability, concluding that the salmon are "back" based on the impressive recent returns in some areas for some stocks is not scientifically justified.

In fact, banner return years for chinook are occurring in only a few regions. Most notably, they are returning in significantly higher numbers in some streams in the Columbia River Basin and the Sacramento River. Hidden in those grand totals is the fact that large fractions of the salmon now returning to Northwest rivers are produced in salmon hatcheries. Wild salmon production is only about 20 percent of the total run size in the Columbia River Basin.

Returns of chinook to streams in the Puget Sound region during the past five years are unremarkable, at still less than 10 percent of historical estimates. Roughly half of the 22 naturally spawning Puget Sound chinook populations are still showing declines.

Second, a large part of the recent Northwest salmon "recovery" appears to be due to natural changes in climate that have cooled ocean waters; changes that won't last forever. Colder oceans increase survival rates for most species of Northwest salmon during their years at sea because there is more food and fewer warm-water predators. Improved ocean conditions for salmon due to these climate changes likely contributed to the impressive comeback for many Columbia River salmon and steelhead stocks.

So how are Pacific Northwest salmon populations really doing? Answering that question is the first challenge for scientists in guiding recovery efforts. Evaluating the true status of a salmon population based on a few years of returns is unreliable, and can result in a false sense of security during good-return years or overly pessimistic pronouncements during poor-return years. Understanding salmon's true population status requires a long-term view.

What we can say reliably is that based on the long-term records of salmon abundance, there is no question that salmon populations currently are a small fraction of their historical sizes. A return of 3 million salmon to the Columbia River Basin represents about 20-30 percent of estimated returns to the Columbia in the mid-1800s. And recent Puget Sound chinook numbers are only about 10 percent of estimated historical returns.

Healthy salmon populations have high levels of both abundance (population size) and diversity (genetic, life history and behavioral differences). This combination of abundance and diversity enables regional populations to cope with climate and environmental variability.

Salmon biologists use a stock market analogy in their attempt to understand the natural resilience to environmental variability experienced by salmon populations. When you purchase shares of a single stock, you may be in for a wild ride in the stock market. Investors hedge their bets by purchasing mutual funds. Combining many individual stocks helps spread the risk inherent in any long-term investment in our uncertain world.

Salmon historically spread out the risk to their populations similarly — they have been successful at riding out the bad times in the past by having different segments of their population doing different things in different places at the same time.

Today's salmon populations are much less diverse and abundant than they were 130 years ago when commercial harvests and drastic changes in their landscape began in earnest. They lack the life-history diversity that buffers their populations against unfavorable environmental events such as floods, landslides or droughts.

The good news in all this is that the recent strong runs of salmon provide a real opportunity to jump-start recovery and reverse the historic decline of our native salmon stocks. Through changes in the way we use water, harvest trees, develop property, produce hatchery fish, harvest fish in the ocean and in streams, and how we operate our hydropower dams, we can allow juvenile rearing, adult spawning and migration in areas salmon haven't accessed for decades. We need more salmon using more and different habitats than we now have. It really is that simple.

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