



RESEARCH SUMMARY

WHAT'S THE ECONOMIC IMPORTANCE OF ALASKA'S HEALTHY ECOSYSTEMS?

By Steve Colt

About one quarter of Alaska's jobs depend in one way or another on the state's fish, wildlife, scenic beauty, recreational opportunities, and public lands. That's a rough estimate of what healthy ecosystems contribute to the economy.¹

Salmon and other natural assets depend on habitat, clean water, and other benefits from Alaska's ecosystems.² Those natural assets in turn support jobs—about 84,000, once we adjust for some double-counting across industries. We include only jobs that depend on healthy ecosystems and natural assets and that are sustainable year after year.³

About half the ecosystem-related jobs rely on commercial, sport, and subsistence harvests of fish and wildlife. Tourism, recreation, and government management of public lands and resources support the other half. (See Figure 1.)

Another way of measuring the economic importance of Alaska's ecosystems is what economists call "net willingness to pay." That's an estimate of how much more Americans would be willing to pay—besides what they already spend—to maintain Alaska's natural assets.

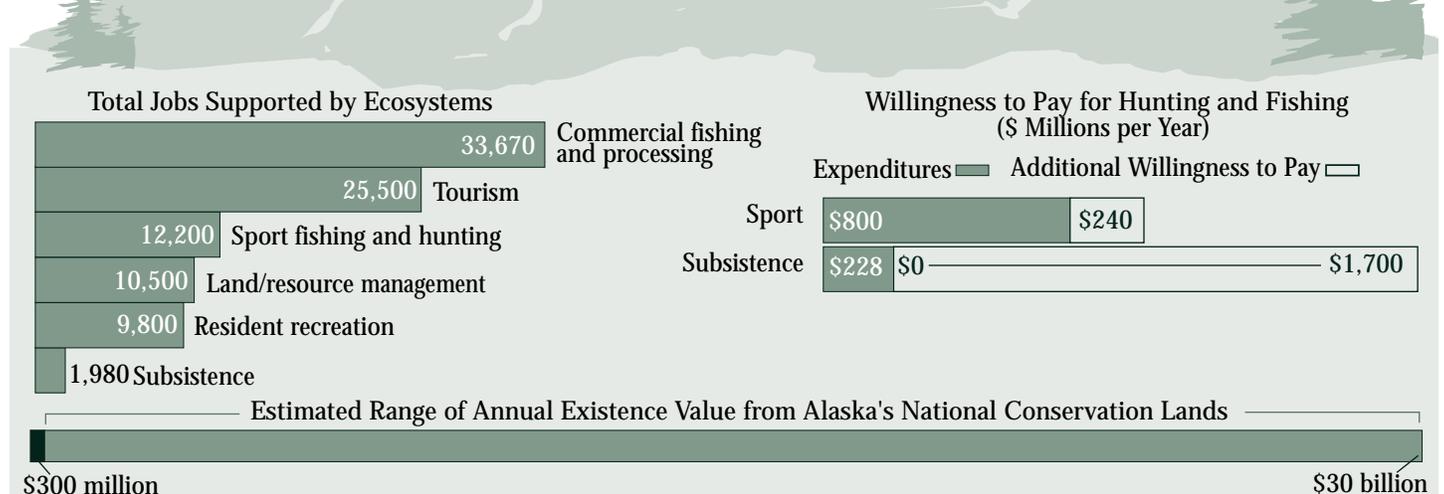
That method allows economists to assign a dollar value to things like scenery. Why would we want to put an

economic value on such intangibles? It's a useful way of showing that—aside from other kinds of value—Alaska's healthy ecosystems have enormous economic value. Our ability to estimate net (or additional) willingness to pay for ecosystem benefits does vary, depending on what's being valued.

For example, Alaskans and visitors spend about \$800 million annually to sport hunt and fish, and available data allow us to make a fairly narrow estimate of how much more they'd be willing to spend—around \$240 million more per year (Figure 1). By contrast, it's much more difficult to put a dollar estimate on subsistence activities, which have cultural, social, and economic value. Our limited data on how much more subsistence users would be willing to pay, beyond the \$230 million they already spend per year, indicate they might pay anywhere from zero to \$1.7 billion more annually.

Also difficult to estimate is the value Americans put on the existence of Alaska's national conservation lands. Based on other studies that have attempted to value wilderness areas in Alaska, we estimate that the potential "existence value" of Alaska's conservation lands could fall into a very broad range—anywhere from \$300 million to \$30 billion annually.

FIGURE 1. ESTIMATED ECONOMIC IMPORTANCE OF ALASKA'S ECOSYSTEMS



This summary is based on *The Economic Importance of Alaska's Healthy Ecosystems*, by Steve Colt, prepared for the Alaska Conservation Foundation. The report is on the Web at www.iser.uaa.alaska.edu/HealthyAlaskaEcosystems/healthy_ecosystems.pdf. Hard copies are \$5.00; call 907-786-7710.

ESTIMATING ECONOMIC IMPORTANCE

We use two methods to measure economic importance of ecosystems and natural resources: (1) economic significance and (2) net (additional) willingness to pay.

Economic Significance

Economic significance measures the jobs and the income associated with an activity or industry.⁴ It includes both the jobs that directly rely on an activity (crew members on commercial fishing boats, for instance) and those that an activity indirectly supports. Those indirect jobs could be in businesses that sell fishing supplies (like fishing nets), or in businesses that supply goods and services (like food or entertainment) to either fishermen or people who sell fishing supplies.⁵

- Of the 84,000 ecosystem-related jobs, about 55,000 jobs are supported directly and 29,000 indirectly.⁶
- Those direct and indirect jobs together generate about \$2.6 billion in income annually.
- About as many ecosystem-related jobs depend on non-consumptive uses (tourism, recreation, wildlife viewing, land management) as on commercial, sport, and subsistence harvests.

Net Willingness to Pay

“Net willingness to pay” is an estimate of how much more people would be willing to pay for something—from a can of soup to a wildlife refuge—than they already spend.

Assessing how much people are willing to spend for a commodity or an experience in theory allows economists to assign a dollar value to anything. We estimate net willingness to pay either by asking people how much more they would spend for something, or analyzing what they actually spend.

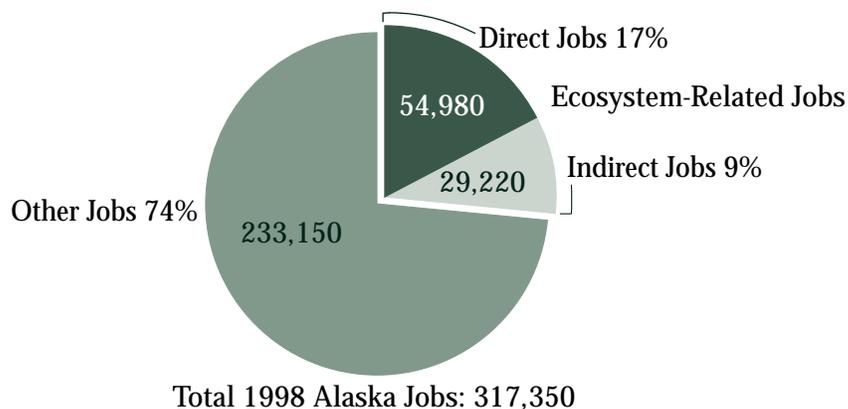
We can estimate with more certainty people’s additional willingness to pay for fairly specific activities like going sport fishing than we can less tangible—but still real—benefits like the continued existence of undeveloped areas.

FISHING AND HUNTING

Alaska’s fish and wildlife are harvested for sale, for sport, and for subsistence.

- *Commercial fishing (including processing) employs more people than any other private basic sector, directly supporting nearly 20,000 jobs and indirectly about 14,000 more.* It produces more than \$1 billion in annual income, or close to 40 percent of the total income associated with ecosystem-related jobs.
- *Sport fishing—especially by visitors—grew sharply in the past few decades, and it now directly supports 6,600 Alaska jobs and indirectly supports another 2,600.* It generates about \$230 million in annual income.

Figure 2. Ecosystem-Related Jobs as a Share of Total Alaska Jobs



- *Subsistence hunting and fishing—mainly by Alaska Natives—support close to 2,000 jobs and produce \$60 million in annual income.* We don’t typically think of subsistence activities as producing jobs, but these numbers make sense if you consider the fishing nets, rifles, snowmachines, and other equipment and supplies subsistence users buy.

- *Americans’ additional willingness to pay for commercial and sport harvests is in the range of several hundred million dollars annually.*

- *The limited available data suggest subsistence users might be willing to pay as much as \$1.7 billion more annually to continue subsistence hunting and fishing—which have cultural, social, and economic value.*

TOURISM AND RECREATION

- *Tourism is the only private sector industry in Alaska that has grown continuously since statehood, now directly supporting nearly 17,000 Alaska jobs and indirectly another 8,500.* It produces \$650 million in annual income.

We define “tourists” here to include non-residents who visit Alaska primarily for pleasure; we discuss resident recreation below. More than 1.1 million tourists visited Alaska in 1999; that number is expected to keep growing.

- *Recreation among Alaskans—excluding sport hunting and fishing—supports close to 10,000 Alaska jobs and produces about \$240 million in annual income.*

About half those recreation jobs depend on wildlife viewing and the other half on hiking, camping, skiing, and other outdoor recreation activities. No systematic data is collected on these activities, but the limited data available suggest that it is up sharply in the past decade.

No one has yet fully quantified Americans’ additional willingness to pay for tourism in Alaska.

TABLE 1. ESTIMATED ECONOMIC IMPORTANCE OF ALASKA'S ECOSYSTEMS

	Economic Significance			Net Willingness to Pay	
	Direct Alaska Jobs (average annual)	Total Alaska Jobs (average annual)	Total Income (\$ million)	Low Estimate (\$ million)	High Estimate (\$ million)
Fishing and Hunting					
Commercial Fishing and Processing	19,928	33,669	\$1,011	\$192	\$360
Sport Fishing	6,635	9,236	233	215	215
Sport Hunting ¹	2,160	2,987	75	23	23
Subsistence Harvests ²	1,978	1,978	61	0	1,700
Tourism and Recreation					
Tourism by non-residents ¹	16,871	25,512	643	Not yet fully quantified	
Wildlife viewing by residents ^{1,3}	3,615	4,896	123	17	37
Other recreation among residents ⁴	3,615	4,896	123	Not yet fully quantified	
Public Land and Resource Management	4,534	10,475	527	Not Applicable	
Life-Support and Existence Value					
Life-Support Systems		Not Applicable		1,200	1,628
Existence of National Conservation Lands		Not Applicable		309	29,652
Existence of Other Natural Ecosystems		Not Applicable		Not yet fully quantified	
<i>Adjustment for jobs and income counted in more than one industry⁵</i>	(4,356)	(9,450)	(238)		
Adjusted Total	54,980	84,200	\$2,559	\$1,957	\$33,615

¹Total income for sport hunting, resident wildlife viewing, and tourism is estimated using the income to jobs ratio for sport fishing.

²Subsistence-related jobs are cash jobs related to providing commercial inputs (like fishing nets) for subsistence.

³Wildlife viewing jobs and income based on primary purpose trips and secondary purpose trips. Net willingness to pay low estimate based on primary purpose trips; high estimate includes secondary purpose trips.

⁴Lower bound estimate

⁵Some jobs and income are double counted. The tourism industry includes non-resident sport fishing and sport hunting and therefore double-counts some jobs and income reported for those activities. Also, jobs supported by ecosystems may be double-counted when commercial fishermen or others with direct jobs in one ecosystem-related industry spend money for another activity (like sport fishing).

PUBLIC LAND AND RESOURCE MANAGEMENT

• *Management of Alaska's vast public lands and resources directly generates about 4,500 jobs and indirectly another 5,900.* Many of the direct jobs are in private businesses that supply goods and services to agencies.

Nearly 90 percent of Alaska's 375 million acres are public lands, with about 240 million acres of federal lands and close to 100 million acres of state lands. Most of those public lands are undeveloped.

LIFE-SUPPORT AND EXISTENCE VALUE

Up to this point we've talked about the economic importance of various ways Alaskans and other Americans use natural assets—including both hunting and fishing as well as non-consumptive uses like hiking or looking at wildlife.

But there are additional benefits from ecosystems that are much harder to quantify: the life-support services (like supplying clean water) that Alaska's ecosystems provide not only to Alaska but to the world; and the "existence

value" of Alaska's undeveloped lands. This existence value—as the name implies—is the value people place on just knowing something exists, without using it or even intending to use it.

Americans certainly place value on keeping some Alaska lands undeveloped, as evidenced by the 150 million acres of national conservation lands in Alaska. But there's little information to help us estimate either life-support benefits or how much Americans would be willing to pay maintain wild lands. So our rough estimates are a first step toward thinking about possible magnitudes of economic value.

• *The value of life-support services provided by Alaska's ecosystems ranges from \$1.2 to \$1.6 billion*, according to one global estimate applied to Alaska.

• *Americans might be willing to pay between \$300 million and \$30 billion more annually to maintain Alaska's national conservation lands.* That estimate is extrapolated from existing studies of Americans' willingness to pay for wild lands in Alaska.

CONCLUSIONS: LOOKING AHEAD

With proper management and protection, Alaska's healthy ecosystems can continue to provide the fishing, hunting, tourism, and recreation opportunities that today support more than 84,000 Alaska jobs.

And the "existence value" of Alaska's undisturbed lands and waters is likely to become increasingly important in the future, as world population, education, and income continue to grow and ecosystems in other places continue to be degraded.

The great challenge for those who value both a healthy Alaska economy and Alaska's healthy ecosystems is to figure out more ways to capture this existence value.

Two small steps in that direction would be marketing Alaska as a place for retirement and reducing the cost of doing global business through better telecommunications links.

Whatever we do, we need to keep in mind the exceptional economic value Alaska's healthy ecosystems provide.

ENDNOTES

1. The estimates of economic importance presented here are based largely on application and interpretation of existing research and data. A list of sources appears at the conclusion of the full report, *The Economic Importance of Alaska's Healthy Ecosystems*, which is available on the Web at: iser.uaa.alaska.edu/HealthyEcosystemsAlaska/healthy_ecosystems.pdf

2. Ecosystems make life possible—they are communities of organisms that interact with their environment to form soil, create animal habitat, stabilize watersheds, regulate climate, and much more.

3. The figure 84,000 is an adjusted total, minus jobs and income that are double-counted. See note 5 of Table 1 (page 3) for a brief discussion of that adjustment. Ecosystem-related jobs do not include all resource-related jobs. Analysts

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disagree somewhat about which consumptive uses of resources to include in an assessment of ecosystem benefits. In this analysis, we exclude logging, because to date logging in Alaska consists of clear-cutting old growth forests. This practice significantly reduces future ecosystem benefits (like unimpaired habitat, water quality, and tourism). Also, logging is not sustainable in the same way that fishing is. We also exclude mining and petroleum development, because those activities depend not on the health of ecosystems but rather on where there are deposits of minerals or petroleum—and extraction is sustainable only as long as the deposits last.

4. Economic significance is not the same as economic impact. Significance is a measure of all the jobs an activity supports, but which would not all necessarily disappear if that activity disappeared. Economic impact, by contrast, does attempt to measure how many jobs would disappear without some activity. Impact is usually (but not always) smaller than significance. So, for example, if people could no longer sport fish, Alaska would not lose all the jobs associated with sport fishing. That's because people would continue to spend at least some of the money they would otherwise have spent for sport fishing—and so still support a portion of the jobs. But some jobs would disappear without sport fishing; that loss would be the economic impact.

5. Economists generally divide these two categories of jobs into "indirect" and "induced." Here we simplify the discussion by calling all those jobs "indirect."

6. Money that comes into Alaska from commercial fishing, non-resident tourism, and non-resident sport fishing and hunting supports most of the 84,000 ecosystem-related jobs (66,000, or 78 percent). The remaining 22 percent (18,000 jobs) depend on purchasing power of Alaska residents; that purchasing power is generated by Alaska's basic industries like petroleum, federal agencies, and the military.

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