

The State Conservation Machine

Executive Lead: Larry Voyles- Director, Arizona Game and Fish

Technical Lead: Loren Chase, PhD- Human Dimensions Program Manager, Arizona Game and Fish

Product of the Association of Fish & Wildlife Agencies and the Arizona Game and Fish Department

Data collected September 2014- August 2015

Published 2017



Thanks for Assistance

Fred Harders - Alabama

Carol Petraborg – Alaska

Loren Chase – Arizona

Ricky Chastain - Arkansas

Kevin Hunting - California

Michael Regan - Colorado

Hyatt William - Connecticut

Paul Clemons - Florida

Mark Whitney - Georgia

Daniel Quinn - Hawaii

Mike Keckler - Idaho

Mark Reiter - Indiana

Kim Rasler - Iowa

Keith Sexson - Kansas

Paul Peditto - Maryland

Kristin McCarthy - Massachusetts

haron Schafer - Michigan

Kathy DonCarlos - Minnesota

Tamara Jackson - Mississippi

David Thorne - Missouri

Ron Aasheim - Montana

Patrick Cole - Nebraska

Glenn Normandeau - New Hampshire

Paulette Nelson - New Jersey

David Rohrbach - New Mexico

Patty Riexinger - New York

Carol Batker - North Carolina

Scott Peterson - North Dakota

Kelley Moseley - Ohio

Melinda Streich – Oklahoma

Roger Fuhrman - Oregon

Matt Hough - Pennsylvania

Timothy Schaeffer - Pennsylvania

Catherine Sparks - Rhode Island

Emily Cope - South Carolina

Tony Leif - South Dakota

Barry Sumners - Tennessee

Jeannie Munoz - Texas

Michal Fowlks - Utah

Mary Diego - Vermont

Darin Moore - Virginia

Jennifer Quan - Washington

Curtis Taylor - West Virginia

Joe Polasek - Wisconsin

John Kennedy - Wyoming

Executive Summary

This manuscript presents the results of surveys of the 50 state wildlife agencies to assess their collective contributions to the unique system of conservation that exists in America today.

In total, the 50 state wildlife agencies own, manage, or administer wildlife conservation on more than 464 million acres of land and 167 million acres of lakes, reservoirs, wetlands, and riparian areas. State wildlife agencies employ nearly 50,000 employees and leverage the efforts of 190,000 volunteers. Collectively, state agencies have 11,000 degreed wildlife biologists, 10,100 law enforcement officers, and nearly 6,000 employees with advanced degrees. Annually, state wildlife agencies contribute more than \$5.6 billion to conservation through their collective annual budgets.

Clearly, the contribution of the 50 state fish and wildlife agencies is enormous and integral to wildlife conservation in North America.



“The conservation of natural resources is the fundamental problem. Unless we solve that problem it will avail us little to solve all others.”

~ President Theodore Roosevelt

Background

Understanding the logistical foundations of these conservation sectors and their contributions is essential to any discussion of the future of conservation in America...

Wildlife conservation in America today is delivered through the combined efforts of state fish and wildlife agencies, federal land and wildlife management agencies, non-governmental organizations, and private landowners (most notably farming, ranching, and private lands timber). The scope and scale, in terms of the capacity of each of these sectors, is essential to the delivery of conservation in America today, yet there has been only limited effort to quantify the roles of the non-federal sectors in delivering a robust and complex system of conservation.

Understanding the logistical foundations of these conservation sectors and their contributions is essential to any discussion of the future of conservation in America, as is an understanding of the threats to these foundations. Discussions of the future of conservation in America run the gamut, from debates over the value of hunter- and angler-funded conservation systems and whether this has led to a focus that favors conserving only those species for which people hunt and fish, to debates over the role of wildlife conservation on our nation's health and well-being, to debates over the appropriate relationship between wildlife regulatory laws and the economy.



Larry Voyles presenting at the Association of Fish & Wildlife Agencies Annual Meeting, September 2015

The importance of telling the story of the critical role of state fish and wildlife agencies in the fabric of America's conservation system was a part of Director Larry Voyles platform for his 2014-15 term as president of the Association of Fish and Wildlife Agencies. A dialogue was initiated around the need for policy makers and academicians to understand the scope and scale of conservation delivery through the state wildlife conservation institutions, as well as the support mechanisms that enable those institutions to deliver conservation at the scale and magnitude Americans have come to expect.

"The importance of telling the story of state fish and wildlife agencies is critical to the fabric of America's conservation system."

~ Larry Voyles, Director of Arizona Fish and Game and President of the Association of Fish & Wildlife Agencies 2014-15

The Association and the Arizona Fish and Game Department aggregated and began defining information on state agencies' collective contributions to the fabric of America's conservation tapestry by researching existing sources such as the National Survey of Fishing, Hunting, and Wildlife-Associated Recreation and other economic, sociological, and human dimensions research. Much of the story of who we are, what we do and why we do it already existed within the body of literature, but it had yet to be compiled and distilled into a concise message.

To tell this story in a contemporary and comprehensive manner, a survey was initiated to provide a national level understanding of:

1. **The state conservation land trust** - lands and waters managed or controlled by state wildlife agencies;
2. **The state conservation intellectual talent** - the professional human capacity that is performing wildlife conservation across the nation;
3. **The state financial investment in conservation** - the collective financial capacity of the state agencies.

State agencies must
improve the
communication of
basic information:

- **Who** we are
 - **What** we do
 - **Why** we do it
-



Purpose of the Report

This report is intended to help inform the national dialogue on the future of wildlife conservation in America by quantifying the magnitude of the collective conservation effort put forth by state fish and wildlife agencies. It is important that conservation partners are aware that state fish and wildlife agencies shoulder the preponderance of wildlife conservation delivery and have a fundamental responsibility well founded in common law. State conservation efforts have yielded breathtaking returns on investment, but because the future success of the state systems of conservation faces challenges, the actions and decisions we make today may well determine the future of America's wildlife legacy for tomorrow

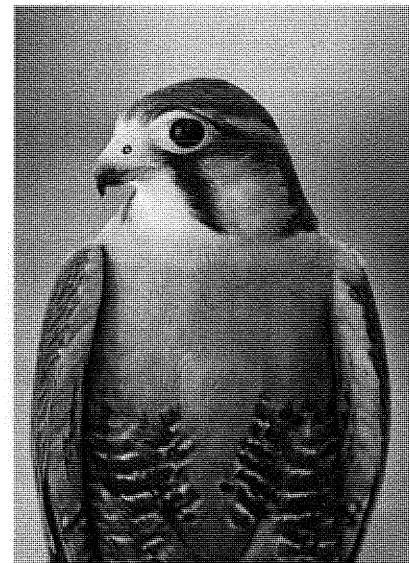
Approach

The elegant simplicity of wildlife conservation in North America is that citizens of states own the wildlife. This concept, known as the public trust doctrine, underpins the North American Model of Wildlife Conservation. Its roots are in common law and it invests authority and trust responsibility for wildlife to the states, rather than to a national entity disconnected from local issues. A byproduct of this dispersed decision-making and authority system is that the aggregate conservation efforts of all states are not quantified in a central location, so the magnitude of this collective influence is underappreciated and not commonly understood.

To build awareness, researchers sent inquiries to the leadership of each of the 50 state fish and wildlife agencies. Agency directors were instructed to reply or authorize executive staff to reply on behalf of the state. With an inquiry of this magnitude, compounded by the fact that each agency is structured slightly differently (e.g. some agencies include parks, some are divisions of natural resource agencies, some split management of wildlife and fish into separate agencies), the questions may apply differently to each state. As such, researchers felt that executive leaders were in the best position to give the most accurate information because they understood the study intent and parameters

Researchers electronically sent the 30-question inquiry to agency directors. Between September 2014 and August 2015, 46 states participated in the study. Contact information was collected from each state's correspondent so researchers could get any needed clarification. Where appropriate, researchers produced centrality, summary, and cross-tabular data. In some cases, summary data intended to reflect continental-scale contribution did not have data from all 50 states. In these cases, missing values from states were replaced with the mean of the remaining states. For example, 42 states reported having a total of 43,515 vehicles, for an average of 1,037 vehicles per state. The remaining eight states were multiplied by the state average ($8 \times 1,037$) and then added to the reported total to estimate the total as if all agencies had reported or had ready access to those data. Therefore, the report gives an estimate of 51,804 total vehicles used for conservation on a daily basis, the numbers being slightly different due to rounding.

...state fish and wildlife agencies shoulder the preponderance of wildlife conservation delivery and have a fundamental responsibility well founded in common law.



The elegant simplicity of wildlife conservation in North America is that citizens of states own the wildlife.

The Conservation Land Trust

The lands and waters managed or controlled by the state, territorial, and provincial wildlife agencies

State fish and wildlife agencies are responsible for managing or administering 464,646,000 acres of land, including lands under fee title ownership (24.5 million acres) as well as those leased or licensed in conservation agreements, grazing allotments or right-of-ways. Further, state agencies manage or administer 166,940,000 acres of water, in the form of lakes, reservoirs, wetlands, and riparian corridors. That is equivalent to 3.7 times the combined acreage of the Great Lakes, or 154 Great Salt Lakes. State agencies have a stake in enhancing all wildlife habitat and therefore also have improved wildlife habitat not owned directly by the agencies. An estimated 56,719,000 additional acres have been improved for the benefit of wildlife through private landowner agreements. Further, agencies own 192,000 water rights and foster 53,000 formal partnerships to carryout wildlife conservation.

State fish & wildlife
agencies are
responsible for
managing 464,646,000
acres of land...



To accomplish this work, state wildlife agencies own nearly 52,000 passenger vehicles, law enforcement trucks, heavy equipment, ATVs, and boats. The fair market value of that collective fleet of vehicles is an estimated \$609 million dollars.



...state agencies
manage 166,940,000
acres of water...
equivalent to 3.7
times the combined
acreage of the Great
Lakes...

The Conservation Intellectual Talent

The professional human capacity that is performing wildlife conservation across the North American Continent

State fish and wildlife agencies employ nearly 50,000 highly-trained and highly-motivated individuals. Agencies collectively have 34,516 full-time employees (FTE) and 13,840 part-time employees. About one-fourth of agency employees, or 10,995 people, are degreed biologists, 5,909 of whom have advanced degrees and 741 terminal degrees (e.g. PhD, JD, DWM). That represents an advanced education achievement 46 percent higher than the U.S. population average. In addition, 8,371 fully certified law enforcement officers and 1,752 law enforcement FTE equivalents from state agencies other than the agency responsible for wildlife conservation also are part the conservation workforce (e.g., state troopers who spend time on wildlife-based activities).

Agency Personnel Allocation

[State fish and wildlife employees] represent an advanced education achievement 46 percent higher than the U.S. population average.

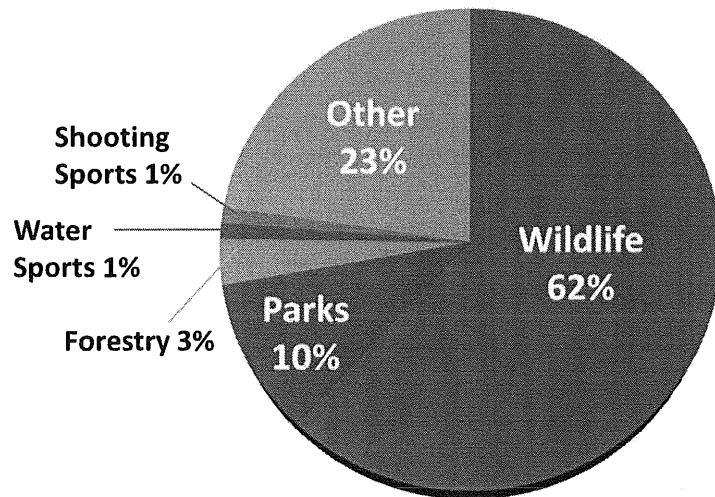
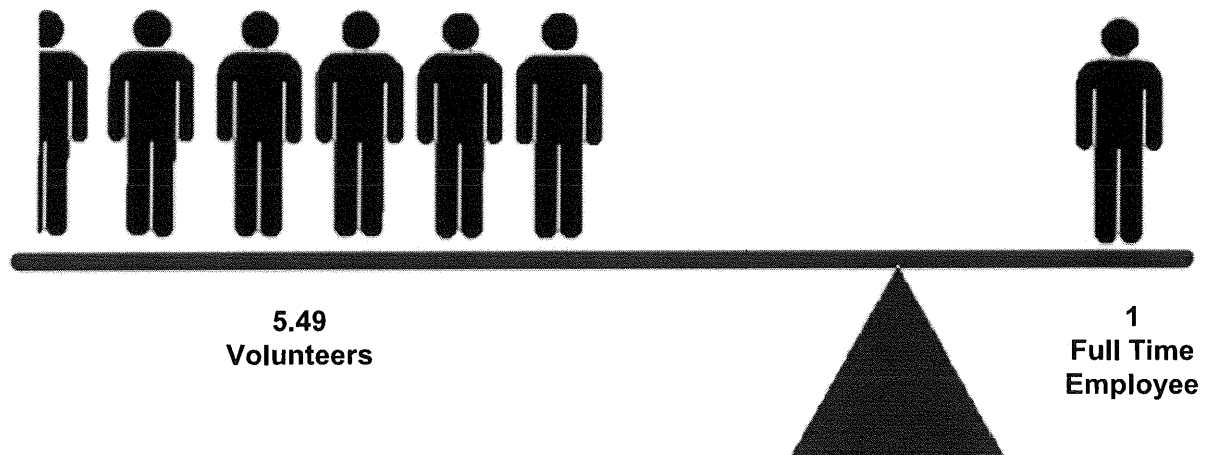


Figure 1-State agency personnel are diverse in their stewardship; however, most are directly allocated to wildlife.

Note percentages may not add to 100% because of rounding and the diversity of how state agencies are organized.

State wildlife agencies have 2,211 employees solely dedicated to educating and informing the public regarding wildlife and issues that affect conservation. Nationwide, agencies coordinate the efforts of 189,393 volunteers who devote their time and energies to wildlife conservation, multiplying our full-time workforce by about 5.5 times



The Financial Investment in Conservation

The fiduciary capacity of the state, territorial, and provincial conservation agencies

The collective annual budget of state wildlife agencies is an extraordinary \$5.63 billion dollars. That amount is the annual equivalent of paying the entire New York Yankees' roster for more than 25 years, and greater than the total economic impact of eight NFL Superbowls. An estimated 58.8 percent (\$3.3 billion) comes from hunting- and fishing-related activities, either directly through the sale of licenses, tags, and stamps, or indirectly through federal excise taxes on hunting, recreational shooting, and angling equipment. These expenditures reinforce the assertion that hunters, recreational shooters, and anglers disproportionately fund conservation. However, 41.2 percent of state wildlife agency funding comes from areas other than hunting and fishing, suggesting that agencies are diversifying their revenue sources

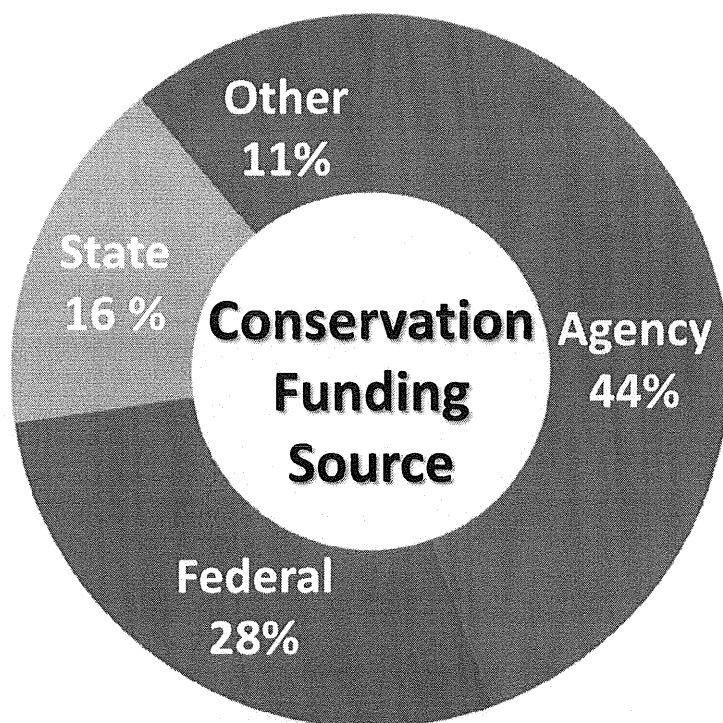


Figure 2- Conservation is funded by diverse sources

CONSERVATION FUNDING SOURCE

State Agency	44%
License Sales	35%
Entry Fee	3%
Small Grants	3%
Watercraft	2%
Trust	1%
OHV	1%
Federal	28%
Pittman-Robertson	15%
Dingell-Johnson	9%
USFWS	4%
Coast Guard	1%
State-Level	16%
General Fund	8%
Non-General Fund	6%
Sales Tax	3%
Other	11%



Conclusions

Modernizing forces are changing wildlife conservation in North America. Industrialization, urbanization, advancement of technology, and the proliferation of higher education have brought a standard of living much different from, and largely unknown to, prior generations. An interesting side effect of modernization is that North Americans are becoming more divorced from nature, a topic often discussed in conservation literature.

This disconnect from nature is reflected in the stagnation of interest in consumptive forms of wildlife and outdoor recreation,

including hunting and angling. Some states have observed a decline in the raw number of people hunting and fishing. Many states' numbers have held steady, while a select few have shown slight increases. Overall, population growth has outpaced the growth of hunting and angling participation to the point that per capita rates of hunters and anglers are declining in nearly all states, gradually becoming less represented in American society. Under the historical model of wildlife conservation funding, these declines in consumptive activities result in waning wildlife conservation revenues.

Concurrent with these shifts is a diversification of cultural heritages that brings ever-broadening perspectives, opinions, and knowledge regarding wildlife. Many citizens of diverse ancestral backgrounds are settling in urban America and becoming disassociated with nature. Though urban-dwellers are a component contributing to a coupled human-natural system, many urbanites are unaware or misinformed regarding the consequences of human action toward the environment. As recently as two generations past, American society was largely agrarian.

Although the topic of wildlife conservation may be immaterial for the average North American, it remains relevant to everyone. The ecosystem services (the benefits society obtains from nature) that are a consequence of wise wildlife stewardship are at the foundation of the economic wealth, political stability, and cultural solidarity for all North Americans. Yet a major problem remains: most citizens do not know who

has legal authority and responsibility for wildlife conservation. They do not understand the success of wildlife management methods, nor do they understand the support foundations that enable those successes. Most importantly, they don't know why this is crucial to us all.

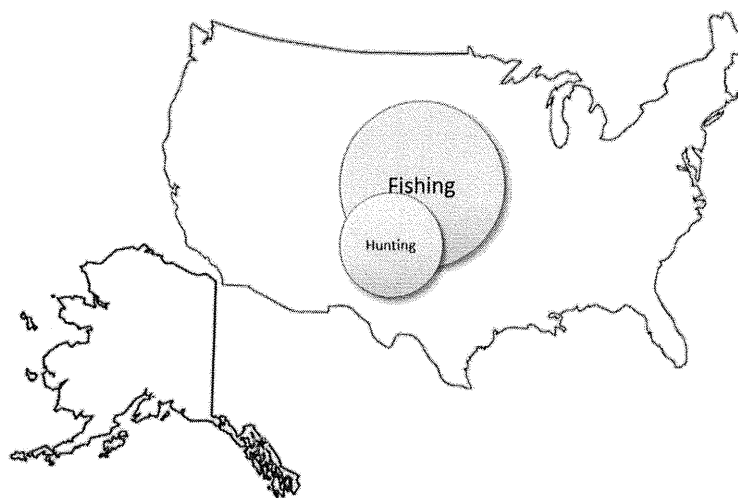
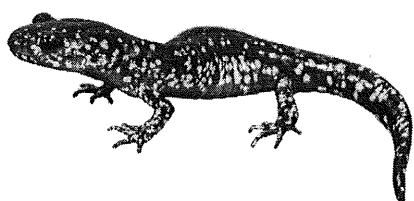


Figure 3 - If the populace of the United States were proportional to the land mass depicted here, the Venn diagrams in the center represent the percentage of US citizens who hunt (1.4%), fish (7.6%), or participate in both (3.0%). (2011 National Survey)

The purpose of this report is to fill that information gap partially caused by this disconnect with nature. Specifically, this report provides information that quantifies the enormous magnitude of effort put forth collectively by state wildlife agencies toward conservation. The return on investment has been substantial as agencies annually contribute \$5.6 billion to conservation. State wildlife agencies employ nearly 50,000 highly- educated employees working and leveraging the efforts of 190,000 volunteers. Finally, fish and wildlife agencies manage or administer more than 464 million acres of land and 167 million acres of lakes, reservoirs, wetlands, and riparian areas.

Much of the conservation funding and land trust has been built and funded with hunters and anglers as the primary benefactors. With the growing separation from nature and the corresponding decline in hunting and fishing, agencies have come to realize that being relevant to hunters and anglers is critical but not sufficient for long-term sustainability.

To continue their impressive contribution to conservation, state agencies will need to shore up the logistical and financial underpinnings of the state conservation system. Contemporary efforts to bolster current systems of funding by organizations such as the Council to Advance Hunting and the Shooting Sports and the Recreational Boating and Fishing Foundation, among many others, will be needed to secure future funding. Exploring entrepreneurial models and new products and services that encourage all citizens who benefit from wildlife conservation to contribute to its conservation will be critical to broaden funding models. Being funded from a wider audience will result in broader societal support for wildlife conservation, which in turn will result in greater financial and political resiliency of state fish and wildlife agencies.

The need for new and broader funding is reflected in both recent recommendations made by AFWA's Blue Ribbon Panel on Sustaining America's Diverse Fish and Wildlife Resources. The first recommendation is to secure an additional \$1.3 billion for the Wildlife Conservation Restoration Program with existing revenue from the development of energy and mineral resources on federal lands. The second is to establish a forum that would examine the impact of societal changes on the relevance of fish and wildlife conservation and make recommendations on how to transform agencies to engage and serve broader constituencies. The first recommendation broadens participation in wildlife conservation funding. The second aims to attract a broader audience outside of our traditional customers.

...most citizens do not know who has legal authority and responsibility for wildlife conservation.

...agencies have come to realize that being relevant to hunters and anglers is critical but not sufficient for long-term sustainability



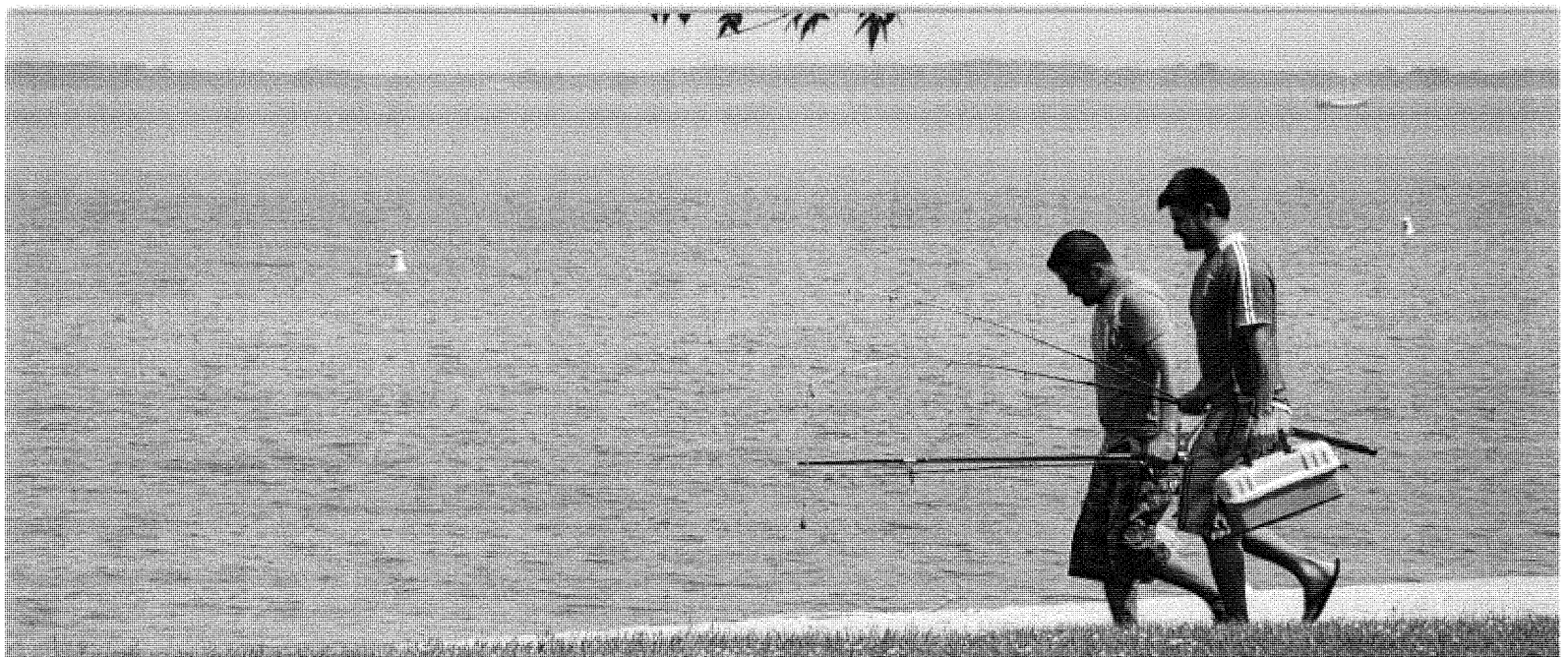
These useful recommendations may take time to implement, as they call for large, sweeping changes within a network of institutions. Yet state agencies can begin this transformation by utilizing four steps:

1. **Tell our story, and tell it often** – Ensure citizens know who delivers wildlife conservation and associated products and services and where the financial resources come from to pay for it;
2. **Tell our story to the right people** – Understand to whom we must be relevant, comprehend their expectations for products and services, and work to be relevant to them;
3. **Tell our story in the right way** – Research which products and services customers want, then deliver the products and services using language and channels the customers trust and value;
4. **Tell the value of our story** – Recognize products and services that have value for our customers and monetize them.

Many states have already begun to move down this pathway. Specifically, Florida has seen an opportunity wherein a small percentage of real estate proceeds go toward the conservation of wildlife. New Jersey dedicates a portion of corporate business tax revenues to the preservation of open space, directly benefiting wildlife. Other states such as New Mexico, Colorado, and Arizona have monetized the growing market of wildlife viewing, each using different methods. Still other agencies are exploring entrepreneurial models by monetizing other products and services that state wildlife agencies are already delivering with or without compensation.

Although wildlife management might not be immediately salient to many North Americans, the ecosystem services that are a consequence of wise wildlife stewardship have great value. By apprising citizens of the role that state fish and wildlife agencies play in delivering these important products and services, we solidly ensure our collective relevancy to future generations of North Americans.

**State survey questionnaire and responses are available upon request.*



PHOTOGRAPHERS:

Arizona Game & Fish (pg 3, 6, 7, 11); AFWA Staff (pg 4); Ohio DNR (pg 5); Virginia Game and Inland Fisheries (pg 7), Utah DWR (pg 9); Maryland DNR (pg 12)