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Transactions of the Eighty-Third North American Wildlife and Natural Resources Conference

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Rachel A. Coon and Matthew C. Dunfee

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appreciates and respectfully acknowledges the special
assistance and cooperation of these partners.

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Welcome and Opening Remarks

Steve Williams
Wildlife Management Institute
Gardners, Pennsylvania

Welcome to the 83rd North American Wildlife and Natural Resources Conference. Thank you all for participating—and special thanks to all the state agencies, federal agencies, nongovernmental organizations, businesses, industries, and exhibitors for your financial support to help make this conference successful. I also want to thank all the special session chairs, workshop chairs, and the speakers for addressing the conservation challenges facing our nation. Finally, thank you Bob Duncan for your welcome to the Commonwealth of Virginia.

WMI has had another busy year. We continued our young forest initiative aimed at forest habitat restoration to benefit more than 60 wildlife species across the northeast. We assisted numerous state agencies by providing administrative services to employ on-the-ground biologists over and above agency designated full-time equivalents. WMI completed an assessment of big game migratory corridors in the western U.S. In conjunction with the Kentucky Army National Guard, we updated the Integrated Natural Resource Management Plans for three installations. We conducted two regional training workshops on the public trust responsibilities of state agencies. WMI conducted numerous workshops and assisted in the development of state agency hunter recruitment, retention, and reactivation (R3) programs. And we hosted the Fish and Wildlife Business Summit to enhance the cooperative relationships among states, the U.S. Fish & Wildlife Service (USFWS), and industry partners.

When we last met, in Spokane, I talked about the transition that was occurring in Washington, DC. At that point, it was too early to predict how that change would affect fish and wildlife conservation. The picture today is only a bit more focused. At the federal level, the Departments of Interior and Agriculture have embarked on reorganization efforts. But most concerning is the policy decisions reflected in the most recent administration's budget request. In that request, funding for six collaborative partnership programs was eliminated. The reduction in requested funding for Ecological Services' listing and restoration programs, Partners for Fish and Wildlife, and State and Tribal Wildlife Grants was significant. Congressional action at the end of last week rejected that budget request and actually provided additional funding for many of these critical, collaborative conservation efforts. Congress also charted a course to fix the unsustainable wildfire funding mess that has plagued federal land management agencies. As you are aware, the president signed that bill into law on Friday.

At least at the federal level, it appears we dodged a bullet. However, the challenges we face as a profession continue to be complex and numerous. Let's not forget that our community has faced adversity for decades and we still have made incredible progress. As Theodore Roosevelt said, "Believe you can and you're halfway there."

In the 1980s, waterfowl managers believed they needed a better way to manage waterfowl and the North American Waterfowl Management Plan was initiated. In the late 1990s, bird conservationists believed that a partnership approach to continental bird conservation was necessary and the North American Bird Conservation Initiative was born. In the early 2000s, fishery managers believed that we needed a nationwide approach to restore fish habitat and the National Fish Habitat Partnership was established. Those successes started with a belief that we could face challenges and achieve success.

Today, sustainable funding for the conservation of fish and wildlife resources remains our greatest challenge. Americans invest in what is important to them. Efforts to make conservation more relevant and to modernize agency programs have sprouted. Because the Association of Fish & Wildlife Agencies (AFWA) believed that a diverse group of interested individuals could chart a new course for

sustainable funding, AFWA constituted the Blue Ribbon Panel. Now, the Alliance for America's Fish and Wildlife campaign carries on that progress by signing on a broad coalition of organizations and numerous congressional cosponsors to the Recovering America's Wildlife Act.

An aging workforce and retirements across federal and state agencies caused concern about a leadership vacuum in our profession. A group of Boone and Crockett Club members believed that a world-class training program would address that challenge. Now, the National Conservation Leadership Institute is in its 12th year with about 420 graduates serving at federal and state agencies, conservation organizations, tribes, and related industries. Trained in adaptive leadership principles, we have a strong cadre of future conservation leaders.

Faced with declining hunter participation rates and loss of financial support for state agency conservation programs, some of us believed that a new approach to recruiting hunters had to be found. From that belief, the Council to Advance Hunting and Shooting Sports was formed. The Council, WMI, and agency colleagues developed the National Hunting and Shooting Sports Action Plan. This plan has spawned a new and focused effort to recruit, retain, and reactivate (R3) hunters and anglers in almost every state. The R3 community has grown nationwide and will hold the first National R3 Symposium in May this year.

Recognizing that effective conservation needs to engage all stakeholders in a shared vision of success, USFWS is developing the Conservation Without Conflict approach because USFWS leadership believed there must be a better way to conserve resources than just employing regulatory measures. Based on success stories in the southeast, northeast, and west, USFWS and numerous partner organizations have committed to a new era of collaborative conservation efforts. These efforts have already achieved success in restoring species in need of conservation without the conflict associated with a regulatory approach.

As Roosevelt stated, "Believe you can and you're halfway there." Individuals and groups believe there are better ways to be successful than what has been done in the past. Whether it was funding, leadership, recruitment, or a new approach to conservation, as a profession, we have faced these challenges head on. In spite of strong headwinds, I believe we have made progress; we will persevere and be as successful going forward as our profession has in the past. We might be even more than "halfway there."

In closing, WMI and others have addressed the issue of relevancy at each of the North American conferences for the last seven years. Today, we will hear from two individuals who believed that change was necessary to make their organizations more relevant to the public. They have put that belief into practice. First, Keith Creagh will discuss his efforts at the Michigan Department of Natural Resources. Second, Steve Smits will tell us how he changed the iconic Zebco Company to become more relevant to customers and society.

As always, I thank you for participating in this conference and thank you for your dedication to fish and wildlife conservation.

The Path to Relevance: Michigan's Story

Keith Creagh
Michigan Department of Natural Resources
Lansing, Michigan

It's a pleasure to be here this morning—I'm humbled and honored to be here. I'm not going to tell you anything you don't know (you're only an expert if you're more than 50 miles from home). So I'm just going to tell you a couple of stories of a little journey and maybe we can learn a little bit together here today.

As Steve said, I'm a recovering bureaucrat. I spent a career with the Department of Agriculture and made absolutely no progress there. I then went to private industry and did high-end food safety, analytics, international registration, and contaminated sites. Then, the governor called and asked me to step in as agriculture director. I was happy where I was, but he persisted and I agreed. I knew the people, I knew the program, I was having fun. Later, the governor came back and asked me to become the Michigan Department of Natural Resources (DNR) director. Again, I told him I liked what I was doing, to which he replied: "Well, I think we could use a little bit better engagement." So, I went and became DNR director for a while and then the Flint water crisis happened. That was as exciting as anyone wants to experience in their career.

Once that situation was somewhat resolved, I went back to the DNR where we had a highly trained professional staff, world-class natural resources, but no revenue. In fact, our legislative relationships were poor at best. People actually ran on an anti-DNR platform; that's how you got elected. I had legislators tell me they would never agree—they were here to fix my department.

That's where we started, with a conversation. As a mere agriculture director in Michigan, with 52,000 farmers and 1,500 food processors, I could put a food processor, a food banker, a retailer, and a producer in the room and I never lost. As DNR director, I've got 1.2 million anglers and I can't win. How do you figure that out? Why is that?

I got all of the conservation coalitions together and we sat around a big conference table and I asked them who works in natural resources. Not a hand went up because no one was in alignment and everybody was fighting for their nickel. They thought of themselves as part of competing groups; you were a grouse hunter or a woodcock hunter or you hunted pheasants. You were a longbow archer or shot crossbow or you were a mountain biker, a snowmobiler, a kayaker, or you rode ORVs Think about that—is that how partner organizations are in your state?

Michigan has 37 million acres—about 19 million acres of forest and 10 million acres of agricultural land. Hunters have access to about 12 million acres, while the DNR has the privilege of managing 4.6 million acres of surface land and owns 6.5 million acres of subsurface oil, gas, and mineral. It's a great portfolio, but land management isn't enough. We had to do something about legislative relationships. We started changing the conversations. So, we started with why. Why do you do what you do? Why are we doing this? For instance, conservation officers (CO)—are they fish and game cops or are they rural law enforcement? Traditional stakeholder groups claim COs are fish and game cops because the stakeholders pay the COs' salaries. If COs were considered rural law enforcement, the general fund would go up tenfold. If you dial 911 in Michigan, a CO shows up. If a plane crashes, a CO shows up. If you have drug problems, a CO shows up.

So, we changed the conversation. For those of you doing fire protection, are you saving state and national forests or are you saving property? Think about where most fires start. In Michigan, 80% of fires start on private land. The DNR is actually saving Michigan families. We're coordinating with local fire chiefs; we're making a difference locally. In some counties, we have the privilege of managing 58% of the land. Some of you are in the same boat—you don't know the county executive on the board of commissioners but you have a majority of their county. So what's important in that community if they can't stand up to fire, police, and schools because of a tax base?

That's when the DNR started talking about new funding—what we were going to do and who was going to invest in us. Our numbers were great with recruitment, retention, and reactivation (the three Rs; R3), but what was our trajectory? What were we going to do and how were we going to figure it out together?

At the DNR, we started changing how we engaged. For instance, when Detroit went bankrupt, Michigan lost 800,000 people and 400,000 jobs—mainly blue-collar jobs held by people who hunted and fished. They were the DNR's bread and butter. That's when Detroit started talking about what they could do along the waterfront and asked us, as the state's natural resource agency, how we were going to help. We started doing wildlife councils and summer youth initiatives and creating nontraditional partnerships.

We were doing great work, but my very first week on the job, I was told there was a $10 million budget hole and 80 people were going to have to be laid off in the DNR. I didn't want to be the new guy coming in and laying people off, so instead, we started talking about how to increase hunting and fishing license fees. The last time license fees had been increased was in 2013 and 2014 with a highly conservative legislature that didn't like fees; before that, the last fee increase hadn't been since 1997. There was a 42.5% reduction of buying power on the dollar, but people wanted more, more on the landscape. Their position was that they were paying our salaries and they wanted to know what we were doing for them. So we started working with stakeholders and working on outcomes. In the end, people don't care about how many employees you have. They care about the experience and the outcome—why are they going to invest in you? They're going to invest in outcomes—boots on the ground, waders in the waters.

We put together consortiums and started working on habitat improvement—stocking more fish, hiring more COs to increase responsiveness, putting together data collections, actually managing some forest, putting a few more cords of wood up on the landscape. The only fees legislature passed were DNR fees. If people wanted more ORV trails with different dynamics, great; we just had to figure out how to pay for it. We had great trails; they just didn't connect to communities—and we needed to figure out how to drive local business.

We started in four counties—Hillsdale, Lenawee, Genesee, and Ogemaw—with no conservation officers. We were at an all-time low. But today, if the current governor's budget passes, we'll be at an all-time high, going from about 172 or 175 sworn COs to more than 255 because we changed how COs are perceived.

It's important to mention, too, that when I got to the DNR, the public didn't necessarily like the department, but they loved our employees. They'd say: "I don't like the DNR, but I really like my parkie. I don't like the DNR, but man, I've got to have the CO there. I don't like the DNR, but could you get me that wildlife biologist who shows up?" What was causing that disconnect and what could be done to strategically make a connection? At the DNR, we already had that community connection. But right here in Michigan, we also had four of the 10 most violent cities in the country—Detroit, Flint, Pontiac, Saginaw. And as DNR director, the governor looked to me for resolutions, but I didn't know how to solve the problem. So, on the governor's recommendation, we started a summer youth employment program to take kids living in cars and in jail and on the tether program and put them to work around natural resources. Today, 69% of the kids from that program go to college or get a job. That's a tremendous rate. We screen them, train them, then connect them with master plumbers, electricians, and construction workers to work on and complete the DNR's parks projects. And all of a sudden, people were asking the DNR to help them.

When Detroit went bankrupt, that was a big legacy cost that had everyone arguing and fighting. The governor wanted one tangible project to show the people of Detroit that state government could make a difference. So we took Belle Isle, a crown jewel that had fallen to rave parties and busted firetrap limits, and we put COs on the island and turned it into a family experience. Through a recreation passport program, visitors can get on the island where there's something for everyone. Belle Isle is now the largest, most attended state park in Michigan, having doubled its annual visitors from two to four million. It was a tough, heavy lift, but it's a great story.

We also just sited the largest chipboard plant in North America in Grayling, Michigan, which was, thanks to my predecessors, an entire area of the state that had been identified as state land prequalified for business. We then brought in the chipboard folks—and their CEO would say they never had a bad meeting with Michigan's state government, an unbelievable feat with the departments of transportation, environmental quality, agriculture, natural resource, and the Michigan Economic Development Corporation all in one room. We never had a bad meeting because we were outcome-based. Instead of being an agency that argued against a chipwood plant because their raw materials would come from clearcutting the endangered Kirtland's warbler habitat in Michigan, we recognized that clearcutting would remove overmature jack pine and create the early successional habitat that the warbler needed. Michigan had another great location for one of the largest chipboard manufacturing plants in the country; we had the wood basket, we had the labor force, and we spent a lot of time in public meetings working to change the conversation, working with the conservation community and helping a threatened and endangered species. It was a remarkable change in partnerships and the way things had traditionally been done.

But I was asked to talk today about how to *be* relevant. How are you relevant? What do you really do? We've got to engage in the language of the day—that's critical. But what is the language of the day? For me, it's infrastructure—what part of the infrastructure are you going to be? For me, the language of today is talking about aggregate on public land, about strategic partnerships, and getting revenue off of that to build a trust fund that will produce and provide high recreational opportunities to the citizens of Michigan. For me, the language of the day is talking about safe corridors, how we can provide safe trails for children in cities like Detroit to and from the doctor's office or to and from schools. For me, the language of today is working with utility companies to ask how they can connect with rural areas; it's talking about invasive species; it's talking about how our state can give its residents water recharge credits as green infrastructure corridors are put together so folks can stay water neutral in a water rich state. These are the things Michigan's DNR can do to be relevant. Get private industry involved, too—how can they help keep us relevant? Understanding the language of the day is critical, but maybe not all of the answers are inside state government.

When the DNR did the license package, the language at that time was: reduce regulations; reduce barriers; be simple, fair, and efficient. There were 140 different license types and we had to capture all of that data, which doesn't necessarily make a big difference on the landscape. The department got down to 25, partially by doing away with senior discounts. But then the governor reminded us that seniors had just been taxed on their pensions and asked us not to take away their discount. So we didn't. Today, there are 40 different license types with a need for even more. It's tough.

My bit of advice—it's not about you or me; it's about the people and the resource. Take GM, for example—its recruiting video looks like a "Pure Michigan" video because they're selling quality of life to young millennials. Of course, in order to do that, you've got to know millennials—you've got to have data. Otherwise, how are you going to connect? How are you going to remain relevant? How are you going to make sure that your resources on the ground meet the needs of tomorrow and not yesterday? The DNR is working to connect and stay relevant by doing the wildlife council, by tacking on the dollar-per-license ($1.6 million a year), by conducting surveys; yet, all the while, I'm thinking: "We need to talk to soccer moms in southeast Michigan and to Hispanic millennials in Grand Rapids." We've got a very open ballot and we do ballot box biology in Michigan—but it's the worst spot to do it. If you talk to big box stores as well as those providing recreational opportunities, is it the hard users or the soft users? Where's the growth? Times are changing and we've all got to be part of the conversation as things progress.

The examples abound: Polaris came out with the Razor, outselling snowmobiles eight-to-one, and the DNR says 50-inch-wide vehicles aren't allowed on Michigan's 12,000 miles of trails—we missed that one. Someone does the demographics on archery and, all of a sudden, we know that older white men with bad shoulders are having a hard time with traditional archery, so crossbows are growing in popularity, yet the DNR wants to fight crossbows—have we really looked at lethality and seasons and impacts and all those other issues? It really is about what's next—how you're going to get there and how you're going to tee that up. You have to be outcome based.

We had folks in DNR wildlife out doing wetland restorations with Ducks Unlimited—spending sportsmen and women's dollars, doing great work, focusing on infrastructure. But we had public lands and reverted agriculture land no one could make a living on and I asked myself: if we were going to be doing infrastructure, wetlands were going to be impacted—with widening roads, putting in new ditches, using public money—so why not do wetland restoration on public lands? And the first response I got was: that couldn't be done on public lands. Why would we do that? First of all, because you'd reduce the cost per acre from between $80,000 and $110,000 to about $30,000 an acre. Secondly, you'd save sportsmen and women's dollars. And finally, the DNR is pretty good at managing land, so why not have some type of diverse population actually enjoying high value, high functioning wetlands. Think about that first response and consider these beneficial outcomes.

I'll close with one final thought on employees. If you always do what you always did, you'll always get what you always got. It doesn't matter what we do on the wildlife side—if we don't pay attention to habitat and forestry, it's meaningless. That's a harsh statement—but guess what? The inverse is also true. If we don't pay attention to the wildlife side, it doesn't matter what we do on the habitat side. So, how do we make sure we're getting effective cross-pollination of ideas and thought processes? How do we make sure it's okay to put a shared trail on public lands? How do we provide opportunities for community partners to actually leverage what we do? At the end of the day, it will be the employees who make a difference. Directors come and go. Issues come and go. Those who solve the problems stay. Problem identifiers are a dime a dozen; solution providers are the gold. Give them support, let them skin their knees a bit (not killing them publicly), and empower them to make a difference and change the culture because it is not them against us. It is "we." And what *we* do, what is taken for granted everyday, is unique. The knowledge, the wisdom, the skills, the passion, and the job we are all entrusted to do are second to none. It's legacy stuff. I'm humbled and honored to be part of the work we do, it's an awesome responsibility—and we *are* relevant. There's no reason why we can't make a difference.

Fishing for Relevance: A Case Study for Industry & Agencies

Steve Smits
North America Zebco Brands
Tulsa, Oklahoma

It's amazing how many similarities there are between what all of us in this room face. Sometimes, what's missed is how close our challenges really are—we're all part of the same industry, and we all think about agency conservation, the resource, and business.

But you're probably wondering: who is this guy? Why is he here and why should I care? I'm really excited—a lot of you in this room manage big businesses. I call it a business because it's a huge organization with a large budget. We know the challenges that go with that. I really think that, as we share some of the challenges we both face and recognize that we have very similar goals, we can find ways to work together.

I have one core message today: it's about industry sustainability, which is built on growth and participation, which will only come by understanding our consumers and being willing to change.

Let me tell you a little bit about our company—we're privately owned by a family called W.C. Bradley. Bradley also is focused in the outdoors and owns TIKI Brand and Char-Broil grills. It's a wonderful family and a wonderful company, and I'm blessed to be part of it. We have a lot of different brands that tailor to a number of different consumer segments—not just fishing. We have a high-end hunting apparel and packs brand in Salt Lake called Badlands—a wonderful business; and we're a global company with brands such as Preston Innovations in the UK, which competes in both the match and carp segments of the market. They're just as crazy over there about their carp as some of the folks are here about bass.

I care deeply about growing participation; in addition to serving on the "60 in 60" committee with American Sportfishing Association, I also serve on the board for the Future Fishermen Foundation, which is all about connecting youth to the sport. As I grew up, my best memories from my childhood were on the lake or in the field. So it's deeply personal to me, and I want my grandkids and their kids to be able to enjoy the resource. That's why I really enjoy coming to events like this.

The other reason is: it's just darn good business. We need to sustain ourselves. I'm lucky to work for a company like Zebco because Zebco has always cared about that. We sold our first spincast reel in 1950, which happens to be about the same time the Sportsfish Restoration Fund (SFR) was established. Very similar to the Wildlife Restoration Act, SFR is a great concept and actually is unique when you think about going worldwide because, at that point in time, folks on the business side of the industry said: "You know what, we're ok being taxed. We think it's great to be taxed because, if we do, we're going to help the resource and ensure its sustainability over time." So I went back and checked with someone in accounting to figure out over time what the estimate was that Zebco had contributed to the SFR since our founding in 1950 and it's about $350 million. That's a lot of money. When you think about what that means on a year in, year out basis to a private company who has a P&L, there are years when that represents about half of our profit—*half*. So when I think about that, I want to make sure the industry and the resource are being managed well and that they're going to grow. Best as I can tell, the industry is doing very well and that's in large part due to the efforts of the folks in this room. But the real critical elephant in the room is that we have to grow because, if we don't, we all know what happens. If your license sales lead to reduced participation or lead to less funding and less ability to improve and maintain the resource, it becomes that self-fulfilling circling around a drain—and we can't have that. The other thing that happens when we go into decline and see participation being challenged, it just continues that cycle. Whenever we have a cost we feel is not giving us return, we try to find a way to eliminate it. It's really critical for all of us that we keep focused on growth and focused on driving participation.

So how are we doing? Well, participation looks pretty good. Here's what we know—most of this is regarding fishing rather than hunting, but the challenges are similar—fishing is a huge sport, bigger than golf and tennis combined. It's extremely popular in the outdoors, number two behind jogging. If you

look at the trends, it's been growing—it was up in 2016, and we don't have the latest 2017 numbers but we're feeling okay. When you dig a little bit deeper, we're not feeling okay. Let me tell you a story: about 18 months ago, the CEO of W.C. Bradley came to me after a meeting where I'd given a report talking about participation, and he said, "Steve, good to hear things are going well. I want to know specifically about millennial participation because you know that millennials are now the largest generation. In addition to knowing how they're participating, can you tell me what we're doing specifically at Zebco to target them? Because they'll be the largest generation for a long period of time. I'm sure you have plans specifically targeted to them that you want to share with me." *Oh my god*—that was pretty much my only thought at that moment. What do you do? You either dance or you tell the truth—and the truth was I didn't have that information ready at hand. I told him we were digging into that right now and told him I'd come back to him in a couple months. As we all know and have all been through, it became crunch time—the entire organization bears down and starts searching for data, going to a lot of *your* websites trying to mine all of the data we can get our hands on, talking to consultants, doing everything we can to get a good feel for how to answer that question. And frankly, it's a darn good question and I was embarrassed that I didn't have an answer.

The data wasn't perfect because there's not as much available as we'd like, and often, there's data but it's not reported. But what we did come up with was pretty directional—and pretty scary. Here's what we know: although participation is steady to growing, there's a real problem in terms of generational participation. When we look at certain data sets, what they show us is that the rate of participation is declining significantly from generation to generation as we go younger. Millennials today are participating at about one-third of the rate of baby boomers. If that rate of decline from Xers to millennials holds true to Gen Zers, we're at a single-digit participation rate. That's really scary. But before everyone freaks out, it's not just that millennials hate fishing—that's not the deal. It's about lifestage. When you go through lifestages, your aspiration or desire to go fishing is sky-high when you're young, it's sky-high when you're going through school, but it drops out when you're an adult with no kids and it comes back strong when you start to build a family. It becomes one of the top 10 aspirational activities you want to do outside during those lifestages and it gets even higher when you become an empty nester and you get to retire and have time to go fishing again. But the reality is that that key bucket in the middle—that adult with no kids—that's where the millennials are right now. What's also scary is that folks are waiting longer to have a family, so that segment is getting wider—we can't wait for that traditional trigger of finally growing up and starting a family so that then hopefully we can expect them to be coming back to the sport. We've got to do something now.

After doing all of that research, I'm thinking to myself: I started my career selling cosmetics and beauty care and, based on the credit card bills I see come in from my wife and my daughter, it seems participation in beauty care is pretty darn solid. Maybe they might take me back. And then I realized I don't really look like a beauty care representative anymore—maybe 25, 30 years ago. So then I got a little bit mad—Zebco is a company that fancies itself by saying we taught America how to fish because when we introduced the spincast push-button reel, it was huge. It made fishing that much easier, especially for the recreational angler, to get into the sport—that became the point of entry into the sport. So I thought: here's a novel idea, how about we start talking to these folks?

This is where we pivot into talking about the consumer. Sustainability depends on growth, and to do that, you have to drive participation and you have to know your consumer. When you think about the consumer, it starts with understanding your segments—what's your consumer base? In our company at Zebco, like any company at times, you start to gravitate towards the more avid because we're all enthusiasts; you're working in the space, you see all this great product, you have access to it, you gravitate that way, and it almost overwhelms all that you're doing. But when you think about it and look through some of these different segments—from novice to recreational to intermediate, avid, and elite—where all the consumers are is intermediate and recreational. That's the huge bucket of consumers—and frankly, those are the ones we are all best positioned to influence. Yet, in Zebco, we're spending a lot of our time talking just to the avids, and we love those guys—our Quantum professional angler just won the

Bassmaster Classic; five of our pros were in the top 10. So we're committed to that space, but it can't be the only thing that we do.

We've got to hit our archery target in the middle. If we're always aiming for the outer rim, we'll just as likely hit the target as miss it completely. But if we aim for the middle, we've got a pretty good chance of hitting the target. Considering the generations, we know we have the baby boomers—we talk to them all the time. They're our core. So how do we focus on the younger generations without alienating the folks we already have?

If we consider how the consumer actually engages with our brands and products and truly think about this as the customer journey, there are four moments of truth for the consumer:

- Zero moment of truth (ZMOT): when you are researching products or activities—do I want to go fishing? Do I want to go hiking? Do I want to go kayaking?
- First moment of truth (FMOT): when you actually make a decision—in our case, it's when you pick up the product and put it in your cart either at the store or online.
- Second moment of truth (SMOT): when you use the product—you get out on the water and use it. Do you have a great experience?
- Third moment of truth (TMOT): when you become an advocate because everything about your experience up to that point has been so awesome.

At Zebco, our historic strength, and where we have put the vast majority of our resources, is on the second moment of truth. We have significant resources tied up—and they're really valuable—in product management, engineering, research, quality, and distribution. It's most of our company. But here's the problem: in today's age, with millennials, with Gen Z, if you don't have content online, you're not even in their conversation. And we had next to zero investment, two or three years ago, in terms of the zero moment of truth. For that entire generation, we were dead to them—unless they had a parent or friend who had introduced them to us, we weren't speaking to them.

So, what's the parallel with your work, with your agency, with your state? I'm not going to speak much about the first moment of truth except to say that when you have a product, be it either something tangible on the shelf you're trying to sell or something that's on your website—make it look good, good packaging, good content. How does this relate to your world? I go out to Badlands about three times a year, and almost every time I go out there in Utah, I go down a few days before and I get my license. I'm in and out in three minutes, download it to my phone—it's a piece of cake. There are other states, which will remain nameless, where I go to fish and it's not that easy. But I'm committed, I'm an angler, I'm going to go fish and I'm going to figure it out. But my son, he'll go fish in Utah if it's that simple, but forget it if it's going to be difficult. He'll go mountain biking. So the challenge for each of you is to say: what's your FMOT? What's your ZMOT? Are you really making it easy for them to engage with you?

When you go to the next step, we've been talking a lot about millennials—we did a lot of research, mined a lot of data, but we went another step and actually talked to these folks. We did a significant amount of focus group research where we sat with millennials, we had certain folks behind the smoked glass, and they told us a lot about what they thought about the category—and their barriers are somewhat intuitive: "It seems boring, bobber watching. There's no action. It's not floating my boat. What the heck?" The other one they said is: "It's so darn complex, are you kidding me? I'm instant gratification guy or gal, can't do it." Then they said: "It looks like you, Steve. Pale man went stale. You guys just don't look like me. We're a diverse group over here."

That's our audience, by and large, here, too—and that's a real barrier. We can actually address that. But they also said: "It takes a ton of time." It really doesn't, but that's their perception. We can figure that out. A lot of what they were saying was something like: "Yeah, I'd really love to go fishing, but is that the only thing I can do on the weekend? Can I make it part of a kayaking trip or a camping trip?" Those are all things that we control. It's about how we reframe the content and the imagery we use to talk to these folks.

Zebco, circa 2016, with its content and imagery and what you'd see on our products and advertisements, on our commercials—I loved it because I'm a sentimental old guy—was a father with his son, a daughter, a kid sitting on the dock. I showed this to my son and daughter, and they were like: "Whatever, Dad." How do we make this look a bit different? It's not hard and it doesn't require that much investment. Learning what we learned from those focus groups, we realized we can get some different content—we can show fishing as part of an outdoor activity, we can show a diverse group of folks participating, we can show it as the number one thing they want to be—social, part of a journey. We can also show, knowing the millennials live more urban than the rest of us, a lot of the urban fishing that goes on. Very rarely do we show that in our advertisements, magazines, and in all of our content. We can do that, too. When you think about content, are you putting content out there that makes sense to the audience you're trying to attract?

We went through a metamorphosis at Zebco, and it was challenging with so many different departments and how to get everyone on message. This was a big shift. Walking through the halls at Zebco, folks gravitate to those who look like them, to their age group, the boomers, the Xers; they gravitate to the avid side. We had to find a way to get their attention. So we put together a short video for internal use to get folks aligned with going in a different direction.

The video highlighted that there are several growing segments of the population that have been underexposed to the Zebco brand and category and that these younger generations, which represent more than 160 million people, possess values perfectly aligned with the Zebco brand: they spend more time outdoors and prefer to connect that way and they are value conscious. To deliver breakthrough growth, Zebco needed to start with that population, winning them over with our core values—that Zebco is social, easy to use, and a good value—while at the same time showing fishing in a whole new light, capturing more of its spirit of adventure and spontaneity, an active outdoor pursuit that is enjoyed by more people in more places than previously imagined.

In the last part of the video—the music, rather than my generation's style and preference, is more popular with my kids and their friends. Even the quality of the video speaks to the fundamental shift Zebco is making. What was most compelling, as we got into our research, and what helped folks begin to understand, was the shift that could be seen with baby boomers and Gen Xers—participation is decreasing. It's pretty simple—our core is going to die at some point, so we need to attract new customers. It has become clear that things need to change; and now that the Zebco team has a bit of context, we understand that the millennial generations are our lifeblood.

My boss Marc Olivié posed his original question about 18 months ago; about a year ago, we followed up with him with a lot of information, and we've since had an ongoing dialogue. We've started doing the work, refreshing our brand, content, and imagery, and there's a lot more news coming this summer. But we've also realized this is an even bigger change and that we can't do it piecemeal. We had to think about our overall, long-range plan, our overall strategy as a company and what it's going to look like. So we engaged a partner and went through an in-depth strategy development process—it was pretty darn effective and not as expensive as you would think. A partner may cost $50,000 to $100,000, but they will help lead you through a process that is so critical because it forces you to confront some uncomfortable truths.

But the first thing you have to know, when considering this process of wanting to change your organization or agency or company, is: where are you right now, what's the current state? Ask yourselves:

- In the last two or three years, have you had a license or revenue decline?
- Do you struggle to support key initiatives because you have no room left in your budget?
- When you're trying to execute change in the organization, do you sometimes get the response: "Come on, this is the way we've always done it"?
- Do you ever walk around the building, going from department to department, and feel like every single department has a different goal and priority?

That's exactly how I felt. When you ask yourselves those questions, good for you because you just got real in terms of identifying the current state of your challenges. The first step is simply recognizing and accepting that things need to change. When Zebco went through this whole process, as our team thought about creating a new strategy, the first place we went was the future—let's go do this, let's go do that, let's go invest in salt water, let's go try all of these new programs. But if you're not grounded first in your current state—what works, where you're deploying your resources, where you're getting a return, what your priorities are—if you really don't have the data, the metrics, all of those things lined up first, all the work that comes after that is just a brainstorm session. By doing the work in identifying your company's current state and confronting the harsh realities or the truths of your business and your opportunities, it helps the team understand.

Then you go through the rest of the process—knowing what we know, where can we go? There may be opportunities. Maybe we can speak to millennials more effectively. Maybe we can do outreach to Gen Z. Maybe we can do different things to make our products appeal more to them. Maybe we can change our website, make it easier to get a license. These are all the type of things that will come from that type of a process. You build a road map and then you go through the execution.

You have to ask yourselves the hard questions. You have to listen. You need to ask folks for feedback, but it's more important to ask folks you don't always ask for feedback. You've got to get out there even further and say: "Hey listen, what are we doing? What's working and what's not?" The further you get, the more standard deviations you get away from your core, the richer the feedback will be. You can't jump to the future until you know the present. And lastly, this process has to be a team effort—it can't be a management thing.

For Zebco, we have about 100 people in North America—we had 15 people on this team who were crossfunctional and multilevel. It wasn't just an executive staff type of deal; in fact, I intentionally tried to limit the executive staff in the group to give it credibility. I chose people in that group who have what I call not formal leadership but hallway leadership because, if they can all come to that type of a conclusion, they have such credibility the organization can't do anything else but jump on board.

Some of the things that were really important for us: we did challenge ourselves to think differently, and where we're coming from as a company now is that we're going to do less but we're going to do it a lot better. We're going to shorten our field. This is hard—as part of this process, we had to go through an early retirement and some roles were eliminated to do this. I'm not going to make it sound like it's easy. Workforce reductions are hard—in 2004, we had 165 people at Zebco North America; we now have 98. That does happen in industry, as well. But we're really using the customer and the consumer to drive our decisions. We think about innovation in the past—gears, ball bearings, drag; but in the future, it's really about process. Are we mining data? Do we have performance indicators? Do we have great reporting? It's a team approach. We need to be integrated; and the great thing about having one plan with shared goals, it makes integration easy. Finally, by doing this work, where it really brought us to, was not just what should we do next, but what should we do in 2020, in 2021? And how can we start to build on that so we're not just going from budget to budget each year but are actually executing a long-term integration plan?

That was our experience. It's not all done yet. But I can tell you it's exciting. And I'm really hoping there are some parallels that you can take to your organizations. At the end of the day, there just isn't a silver bullet—not for any of us. We all have budgets. We all have big organizations. We all have challenges. You all, I would argue, probably have a lot more challenges than business. You have a number of stakeholders—political, regulatory, all this complexity. We're pretty simple—for Zebco, it's about the consumer and about making money, and if we do that well, the other one happens well, too. But as you strive to meet your stakeholders' satisfaction, it's important to understand that you can't ignore the thing that funds your growth.

With that, I want to say how thankful I am to have been able to spend some time with you this morning. It's so refreshing to see folks from different sides of the aisle, who face common challenges, talk about how we can work through them together because we have the same goal. Again, if I were to go back to the very beginning—our industry depends on having long-term sustainability driven by growth

that's going to be supported by increasing our participation and driven by us really knowing the consumer and how to target them better.

Special Session One.
Conservation Built to Last: Advancing Engagement, Inclusion, and Shared Purpose to Address the Challenges of the Future

Opening Remarks & Purpose of the Session

Ali Duvall
Intermountain West Joint Venture
Missoula, Montana

This session began around an idea. The idea was this: If we are going to be successful in developing conservation efforts that are built to last, we are going to have to do a better job at bringing people together through collaboration. And that's not easy because collaboration is about trying to reach common ground and shared purpose. Often that means managing people and factions; reducing polarization between ourselves and our stakeholders; and working through conflict.

Our intent was to create a session where we could take some risks and host a conversation about what brings us together and what holds us back in efforts that seek to achieve lasting conservation. In this examination of collaboration, we were also particularly interested in the question of the relevancy of conservation—specifically, how can we work to bring in new, different, or, you could say, the "unusual" voices of those who have a stake in our conservation efforts?

In preparing for this session, we had numerous conversations and reviewed recent literature (see references) about how and why our community has had some important successes in the realm of collaborative conservation—and how and why we are still faced with incredible roadblocks for the type of transformative change we want to lead and be a part of. The successes are compelling, and we are going to hear more about these in this session.

But what about the roadblocks? Here are two potential reasons we still face hurdles.

First, the complexity of the issues and the challenges that confront us. It's clear that the ecological, sociopolitical, and economic challenges we face in our states and communities are simply unprecedented due to complex, rapidly changing, and multiscale threats and issues that have massive impacts, such as habitat loss and fragmentation; invasive and exotic species; wildlife disease and other accidental deaths; illegal trapping and poaching; and the decrease of precious land and water resources that are essential to our food, energy, recreation, health, and spiritual vitality. It's a fact: The world, as we know it, is changing—and we have to adapt.

A second reason we continue to face roadblocks may be that in addition to the complexity and challenges in front of us, and as human influences become even more pervasive, we still struggle with polarization, division, and unconscious bias that tend to pull us apart or create the "bowling shirt" mentality, instead of aligning ourselves with one another and those who are different from us. This is where collaboration and relevancy are crucially connected and key to conservation that is built to last.

Barbara Gray in her groundbreaking work *Collaborating: Finding Common Ground for Multiparty Problems* (1989) defines collaboration as this:

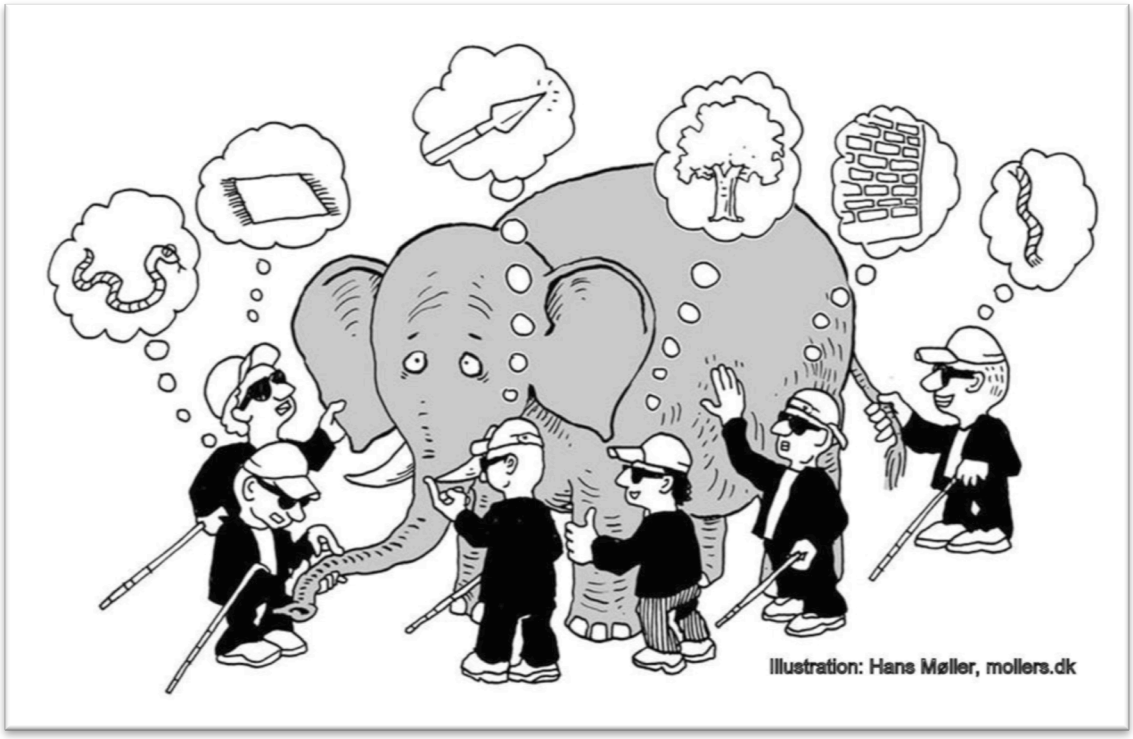
> Collaboration represents a longer-term integrated process through which parties who see different aspects of a problem…constructively explore their differences…[and] search for solutions that go beyond their own limited vision of what is possible.

As such, the purpose of this session is to learn from one another about how to more effectively collaborate and create common ground—and in collaboration, to develop our capacities to overcome polarization, work through conflict, and ensure that a lack of diversity does not exacerbate the growing crisis of the relevancy of conservation.

Our assumption, to in part be tested and tried in this room, is that the diversity of the people at the table, the bridging of resources, and the collective learning to find common ground is exactly what provides the transformative framework for change—for a species, an agency, a watershed group, a community, and for our world.

This graphic (Figure 1) represents the ancient Sufi story of the blind men and the elephant and illustrates the challenge of enabling diverse stakeholders to see the big picture. Each party touches a different part of the elephant and tends to assume that what they experience is the elephant instead of just one part of a more complex reality. Moreover, they tend to see reality in terms of what they are doing well or are rewarded for doing and could do better if they had more resources. In this picture, people either fail to appreciate or question the value of others' contributions. In addition, they often do not have the tools to see a more complex world and understand how their intentions, thinking, and actions interact with those of other stakeholders. To quote Dr. Stephen Covey: "We see the world, not as it is, but as we are—or, as we are conditioned to see it."

Figure 1. Blind Men and the Elephant.



In designing this session, our team was purposeful about bringing in new and different perspectives to help us consider what are we missing as a conservation community, to help illuminate what do we do that we don't even recognize that prevents people from joining our efforts, and how we can bridge these gaps.

Let's challenge ourselves to resist the temptation for silent scrutiny. Let's be open, listen and understand, take some risks, change your view of the elephant, and share in the learning today. Reflect on the people and experiences that helped you shift your lens to more effectively working with others or the system as a whole, instead of championing your own agenda or viewpoint.

For me, it all started in the Blackfoot watershed, home of the Blackfoot Challenge, where people believed deeply that lasting conservation was truly about building trust and relationships through private and public partnerships. They welcomed me into their community and helped me to understand the deep

connection between people and ridge-to-ridge conservation. Collaboration is a part of the DNA in that watershed.

What's your moment, or person, or experience that helped you shift your lens? Jump in, roll up your sleeves, and join this conversation about how to lead transformative change for conservation that is built to last.

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Collaborative Conservation in Practice: Bistate Greater Sage-Grouse

Tony Wasley
Nevada Department of Wildlife
Reno, Nevada

Sherri Lisius
Bureau of Land Management
Bishop, California

Shawn Espinosa
Nevada Department of Wildlife
Reno, Nevada

Susanna Danner
Eastern Sierra Land Trust
Bishop, California

I want to thank everyone for coming; it's great to see this much of a turnout. I was concerned when Ali put up the slide of the elephants, all the fish and wildlife service people were going to head for the exits.

There's an interesting irony in preparing a special session. As we began to talk about it, our thought was that we could share some of our experiences and invite an engaging conversation. I have to admit this has been a huge learning process for me and it's really challenged my biases and my paradigms related to collaboration and collaborative conservation. I want to share the evolution of my philosophies around collaborative conservation. When I first began as a field biologist, I can remember being invited into an holistic resource management meeting and I was annoyed because I knew what was right—I had the science, I had the data, I was in the field, and it was annoying to have to go to a meeting and try to redirect resources in the Bureau of Land Management to go disproportionately to a small number of permittees. That was more than 20 years ago, and I can safely say that I see it not only as a necessary part of building lasting conservation, but it's essential. It's essential not only for the conservation side of things but it's also essential for relevancy.

What we want you to hear today are diverse perspectives from a specific conservation collaborative that makes you question your own biases and perspectives and achieve a greater awareness of your perspectives and the perspectives each of these panelists bring.

We're going to talk about the bistate sage grouse, but first a quick history to set the stage—a foundation of the species and a population area that's roughly 4.5 million acres. The petitions to list the Mono Basin population of sage-grouse were received in December 2001 and November 2005. In 2006, the U.S. Fish & Wildlife Service (USFWS) found that the petitions did not provide substantial information for listing the sage-grouse as a threatened or endangered species. In 2010, the USFWS found the bistate sage-grouse constitute a distinct population segment (DPS). They also found the bistate DPS warranted but precluded along with the greater sage-grouse. In 2015, a finding of "not warranted" was rendered due to the conservation efforts and financial commitments. The "not warranted" finding relied in part on the greater sage conservation plan completed originally in 2004 and the bistate executive oversight committee, which was formed in 2011. There was a three-tiered approach. The executive oversight committee directed the technical advisory team to develop an action plan and the plan was informed and implemented with the input and engagement of a local area working group. The plan contains 76 specific projects. USFWS concluded that the projects, if implemented, would be adequate to preclude the need to list—the only problem was it would cost approximately $38 million. So again, through this collaborative effort, we went to all of the partners to ask what they could contribute in an

effort to reach that bottom line. In the end, they not only met but exceeded that amount with a total of $46 million.

The Catalyst for Collaboration

Preparation for this topic included collecting individual experiences along with interviewing long-term members of the bistate conservation effort. At the Bureau of Land Management (BLM), current team members have the opportunity to work with wildlife biologists who held positions at the BLM previously and who volunteer today to help count sage-grouse, which helps with continuity. When asked what they believe catalyzed this issue, the answer was that the listing was the catalyst—it brought people together, it was a problem to solve together. But they also said they had already been working for years on how to improve the sagebrush habitat—generations of BLM biologists had already started building key relationships with the ranching community, which is one of the key successes.

The new generation of wildlife biologists at the BLM, however, didn't even necessarily know what a grouse was and had never worked with them. They saw the sagebrush system as merely a sea of sagebrush with not a lot to it. They weren't excited about that aspect of the job. It was the longtime biologists who wooed the newcomers into the sagebrush system—got them out on lek counts, introduced them to the area—and that's a key part of the bistate. There wasn't a plan in place to get every new biologist out to take part in these certain tasks. But previous BLM biologists took it upon themselves to take the new folks out for sage-grouse lek counting. And that's what sold the new biologists—they became converts. When you see that crazy looking bird out in the sagebrush, it is transformative. New generations have become the sagebrush champions and that's what has inspired them to participate in this effort—the amazing outreach from long-term biologists.

From the perspective of the Eastern Sierra Land Trust, one really neat thing about the bistate collaborative is that it was an opportunity to focus on something many believed in. There was not a source of conflict around the sage-grouse because a listing was preemptively staved off. Starting from a place of success in the beginning—in other words, there wasn't litigation that caused the collaborators to come together, there wasn't a pitted fight—it was realized that if the collaborators started out working together, the chances were very good that they would be able to reduce the likelihood of regulatory oversight. There was a collective desire for a final outcome that was less regulatory and more collaborative, and the private landowners, who the land trust worked with primarily, saw the opportunity to use the land trust as a bridge for those who were not as comfortable working with government. So, the land trust started from a place of joint concern and ultimately provided a buffer that was helpful in encouraging landowner participation.

The listing process has been an ongoing saga during the past 15 years, but it was in the 1950s, with the sage and Columbian sharp-tailed grouse, that it was recognized that there was an issue with sage-grouse populations across the range. The issue did not receive much attention for several decades. Then, in the 1990s, people noticed a loss of habitat and transformations on the landscape that were not suited to a species that was landscape-scale dependent. In 2000, there was a conservation-minded governor who established the Nevada Department of Wildlife (NDW) sage-grouse conservation team and charged them to come up with a strategy for addressing the issues and threats that were facing sage-grouse. A strategy team was instituted and the concepts for local area working groups were established. The strategy developed a roadmap for local working groups to look at the threats, develop recommendations, and look at adaptive management. Finally, through the establishment of the first bistate conservation plan and then the action plan, the local area working group realized they were not necessarily an entity focused on avoiding the listing. Instead, they were focused on a recovery plan for local sage-grouse and that underlying premise is what made the group successful.

Sustaining the Momentum of Collaboration

There are several people who have been associated with the NDW sage-grouse conservation team for a long time, so longevity has helped in sustaining the group's collaborative efforts. There is also a facilitator who has been on board for all of the 18 years since the local working group has been established. That facilitator has been the glue that has kept the group together—establishing agendas, initiating meetings, and keeping minutes. During the meetings, there is a lot of information sharing, which keeps people engaged, and seeing the success of those projects builds the trust that shows everyone NDW is doing what it can, working with partners to make meaningful differences.

One of the most interesting things about the bistate is the longevity of folks' participation—the time it has taken the collaborative to get to where we are today. Not everyone has that luxury; more than likely, many in the audience today are working on species, just starting to create a group like this, looking at the long-term and hoping for a similar outcome. The diversity of partners in this local area working group is quite unique. There is a gamut of folks in the bistate region, including agency partners, land trusts, other nonprofits such as the Audubon Society, environmental groups, regulators, tribes, and community members such as landowners. This group also creates a safe space, particularly with the facilitator present, for anyone to talk about what their concerns are and ask questions of the experts, especially given the scientists there are those who are actually in the field doing the lek count, learning about the species. It's rare for a member of the public to have regular access to such a broad group of people. There were almost never conflicts in the meetings and that openness makes the group unique.

Partnership, Diversity & Trust: The Keys to Collaborative Conservation Success

This local area working group does not see boundaries—it truly is boundary blind. In some ways, Mr. Rogers was the first conservationist on public television, and he said, "I hope you are proud of yourself for the times you said yes when all it means is extra work for you and it was seemingly helpful only to someone else." That epitomizes what happens in the bistate. Team members from the BLM can call up the Nevada Department of Wildlife and say: "I need an auger and I'm in California." And the NDW will deliver. NDW is doing all of the Bureau of Land Management's (BLM) vegetation work and surveys in California, which is remarkably unusual. The partners involved are willing to take risks because they have spent so much time building relationships. The longevity is so important—you can't build longevity, but you can take advantage of it. For instance, former BLM biologists who still live in the area can introduce the new BLM biologists to the local ranchers and partners. Long-term trust can't be replicated but that trust and those connections can be passed on—and modeling that behavior is strongly encouraged as new biologists join the BLM. Also, let people know they are being heard. Some partners came and told the same stories at every meeting, and the key was: they were heard. The BLM actively listened and worked with them to come up with creative solutions. It's not about aggressively dealing with conflict; it's about waiting. When everyone gets a seat at the table, it's slower; you cannot be in a hurry, conservation takes time. To do it right, it takes time to build relationships. And there is no leader; it is a group effort.

To a degree, luck has played a part, as well. In Nevada, there are a few ranches that form the largest portion of brood ring habitat. Without that habitat, the Nevada population of bistate sage-grouse would unravel. Working with landowners and having them recognize the importance of the habitat was important; the ranchers had a sense of urgency having seen what was happening on nearby ranches and farms being subdivided and developed, which they did not want to see done to their property. Luckily, the sage-grouse initiative came along with the Natural Resources Conservation Service (NRCS) and there's some ability now with conservation easements. But for some reason, the Nevada Department of Wildlife had a better relationship with ranchers and landowners on the western side of the state than with the eastern side, so a past game division chief who'd grown up with one of the eastern landowners asked the landowner to consider a conservation easement on his property. Through the NRCS, the NDW was able

to get a conservation easement in place—and neighbors followed, which was a huge benefit because that demonstration of conserving those lands was an important factor in avoiding the listing.

From the land trust perspective, certainly it would be expected that the land trust would have more experience and greater affinity for private landowner relationships than some of the history of state wildlife agencies and landowners where conflict is sometimes more common. The Eastern Sierra Land Trust has made efforts to foster and promote those relationships in the bistate area. Like much of the West, most of the public lands in the bistate area are forests, rocks, higher ground, and in the case of the land trust, BLM owns most of the sagebrush landscape. But just as in the rest of the West, most of the springs and wetlands are private, and so the land trust would not have success if it weren't for conservation on both the public and private lands. The private landowners, even though they own a tiny fraction in the bistate, are central to the collaboration's success, and working with them has been essential. The original biologist who worked on this effort stressed the importance of hiring—bringing people in not just because they have the credentials but finding people who are willing to listen and be personable and willing to meet with a rancher or agency member on the ground and talk about good outcomes. This is so critical—the people brought on to be a part of this collaboration have to be the kind of person anyone would want to open up to, who will do great whether they're meeting with an environmental advocacy group or a conservative rancher. Over the years, the land trust has seen that, whether it's employees or folks who work for Audubon or the state wildlife agencies or the federal government—they are people who can listen. Because you have to meet the landowners halfway and find common ground; most landowners in the bistate grew up on these ranches and love sage-grouse because they have an affinity for a creature who can survive in difficult circumstance just like they themselves can. Bringing that human element has been a critical part of the collaborative success.

The Challenges Encountered & Overcome

When you preclude a need to list and have a longstanding partnership, it's easy to celebrate; but that doesn't mean there weren't hurdles and challenges along the way. The overarching hurdle was coming together and finding common ground. But part of the original hurdle was the Endangered Species Act, along with multiple listings and people who didn't agree but still had to be heard. These challenges were overcome by being respectful and listening. And now, there are new hurdles. In the early days, it was about getting everyone onto the same page about grouse—early biologists wanted to do Grouse Biology 101 so everyone could learn and understand why grouse habitat is important not just for the ESA listing but in general. Today, challenges involve the changing face of partners involved; before, partners were landowners and ranchers who'd been in the bistate for generations, and now, new partners don't have that history, so they have to be brought into the fold of the importance of what the BLM and the conservation collaboration are doing and what their role is therein. It's an interesting element many collaboratives don't experience—that having been so focused on building trust and relationships for 18 years, the bistate faces new challenges when trying to bring new people in.

For those who have dealt with a species that may be listed as threatened or endangered, the Policy for the Evaluation of Conservation Efforts (PECE) is an onerous process, and during the listing phase, the part of the PECE that deals with certainty of effectiveness and implementation can be a heavy lift. The bistate group was fortunate in having a record of projects that had been implemented and could demonstrate their effectiveness through vegetated monitoring. Sage-grouse take a long time to respond to vegetative treatments; the collaborative had a good integrated population model to demonstrate what the bird was doing throughout its history, which was stable. But funding for the implementation piece was difficult to come up with, as was determining how much those 76 projects were going to cost. Meeting the criteria for PECE was one of the real challenges—it was almost like having to go through a species recovery. Another challenge was communicating the science to the local area working group. When science and the methodology associated with results analysis is emerging and adapting so quickly, it's difficult for the project manager to keep up let alone try to communicate that science to a rancher or local working group member who may not have that knowledge base. The collaborative is still trying to

address that and hopes to improve in communicating the science, especially with respect to bistate sage-grouse.

Addendum

Panel Q&A

Q: Developing relationships and learning how to listen are important at these collaboration conservation sessions, but at some point, it has to be determined what to do on the land. Did the bistate group get to the point where you were describing the desired future condition of the land—not just in general, but down to the individual species level, considering how important each species was to the composition you wanted and how it existed now? Without good conservation practices, good techniques cannot be developed.

> A key partner we failed to mention is the U.S. Geological Survey (USGS). The bistate collaboration has an incredible relationship with the USGS and the science behind this—the integrated population model, the habitat suitability model—is second to none. There is cosupported, codeveloped science that underlies a lot of these decisions. And there's another phase of bistate where the collaborative got lucky, in terms of the threats. Livestock grazing did not come out as one of the higher threats. The bigger threats for bistate were conifer encroachment, urbanization, and wildfires—though, because conifer encroachment was the main threat, everybody got behind removing conifer. What that meant for the landowner or the rancher was that, once the conifer was removed, they saw a response in the bunch grass community, meaning they saw a benefit for themselves, which then benefited the bird.

Q: You mentioned that, at the Bureau of Land Management, you learned a lot about the sage-grouse community. What are the specifics incorporated into the action plan?

> The action plan does get into those specifics. We have vegetation monitoring before and after treatments. There's research; there are actions, many of which are to evaluate the areas. So, there are specifics, but we didn't get down to that level because we left that for project planning. We put some bigger umbrella actions in there—to review this area for conifer, to take a look at the vegetation and if it will respond. It's a nice mix of actions and science to determine if it's working. The beauty of having the Nevada Department of Wildlife do all of the vegetation work, is that they're doing all of the monitoring across the bistate so that we're able to have one data set for all of the work we're doing, no matter whose land we're on.

Q: What are your measures of success and what happens if there is something unrelated to habitat that makes sage-grouse go away? Would this collaboration continue in that instance?

> In a way, the risk of that is much less likely than it was in the beginning. This is not about sage-grouse; it is about sagebrush systems. So if you have intact sagebrush systems, then you have a great economy, you have major scenic value, you have recreational value—there's all kinds of other benefits besides just sage-grouse. Last year, we were informed that pygmy rabbits, another sagebrush obligate, may have some of the similar genetic distinctions as sage-grouse due to the same geologic factors, so there could be another species that arises much the same way sage-grouse did as a priority. We have a coalition that we have developed successfully around many other features of the land other than just one species and that will benefit us—and the land—in the future. And the ultimate measure of success is how the bistate population responds to our actions. It's going to be largely climate-driven, but over time, with some of the conservation actions in place, things will get better. Future projections show a stable population, and if we can maintain or slightly increase that population, then that's the ultimate measure of success. We are

looking to conserve the sagebrush system as well as the sage-grouse. We have a complex database that tracks all of our actions, and so, success is also telling our story about all of the work we've come together to do and how that's reflected in the habitat and relationships we've built over time.

Breaking Down Barriers to Collaborative Conservation and Meeting People Where They Are

Ali Duvall
Intermountain West Joint Venture
Missoula, Montana

Noreen Walsh
U. S. Fish and Wildlife Service
Denver, Colorado

Dr. Mamie Parker, of M.A. Parker and Associates and former assistant director of fisheries and habitat conservation for U.S. Fish & Wildlife Service, was invited to facilitate this panel session because of her skill in leading, coaching, and mentoring in addition to her professional background and deep passion for collaborative problem solving and fostering diversity and inclusion. Parker kicked off the session with the inspiring idea that we need to talk more positively to one another and realize that we are "built to last" in this new era of conservation and invited her fellow panelists and the audience to help create a revolutionary and transformational experience to stretch the conservation community.

This is not an easy subject. As Suze Orman says, "We have to do what is right and not what always is easy." This is true, especially when we consider issues of engagement, inclusion, and shared purpose. As we encounter the loss of wetlands, fire, sea level rise, fish kill, and dirty water in Flint, Michigan, issues like these will require us to work together. Parker urged us to focus on developing trust and to take quantum steps to overcome our fears. Her mom always told her fears are false evidence appearing real. She emphasized that the panelists in this session were each identified to attend because they represent different, nontraditional voices; are also implementing conservation; and can help us break down barriers. Parker also stressed that our goal is truly about helping the conservation community figure out how to meet people where they are.

The Important Voice of the Private Landowner

Will Rogers said: "You can be on the right path, but if you're not moving, you'll still get run over." That quote was shared by panelist Jimmy Bullock, senior vice president of Resource Management Service (RMS); he is responsible for sustainable forestry, environmental policy and programs, and advocacy on forestry issues for RMS-managed timberlands in the United States as well as forest certification and audit programs and environmental, social, and governance initiatives for RMS-managed timberlands globally. He is from Bogue Chitto, Mississippi, and is the fifth generation to live in the house he grew up in and seventh generation to live on the land.

When considering how to develop collaborative conservation that's built to last, particularly from the perspective of private landowners, there are a couple of shared commonalities: first, landowners are fiercely proud of their land and have a deep connection to it and feel part of the land; and second, all private landowners want to be good stewards of the land. In order to be good stewards, it's imperative to be able to pass the land on to future generations better than it ever was.

But why is the private landowner voice important? People in the conservation community would like to say the private landowner's voice is always heard, though Bullock suggested this is not always true. When it comes to something like SECAS—the Southeast Conservation Adaptation Strategy, a model for collaborative conservation around the South that takes key objectives from states and federal agencies and puts them together in a blueprint for conservation success—the private sector is nowhere to be found in developing that blueprint. In the eastern U.S., nine of every 10 acres is privately owned; and even though many private landowners have a voice in conservation, they are still not everywhere they need to be—there is still more work to be done.

Just go back to 1990, for example—this was an important year for the Endangered Species Act. It was the year the northern spotted owl was listed as threatened, but it was also the year the U.S. Fish &

Wildlife Service proposed to list the Louisiana black bear, found in east Texas, Louisiana, and the lower two-thirds of Mississippi, with nine out of every 10 acres of habitat on private land. From coast to coast, *The New York Times*, *The Washington Post*, *The Oregonian*, and every paper in between touted the Louisiana black bear as "the spotted owl of the South." And it could have been. But instead, a group of private landowners in Louisiana, under the auspices of the Louisiana Forestry Association, agreed they could do things differently by collaborating with all willing voices in the room. They were determined to find a better way—to understand that the concern wasn't about the bear being listed or not but that the issue needed attention. Even though the Louisiana black bear was listed as threatened in 1992, these private landowners and their partners decided to focus on working together to conserve the bear and its habitat. Fast-forward to 2016, the Louisiana black bear was delisted because of the partnership between all of the entities involved. It's a tremendous conservation story.

Today, collaborative conservation stands on the brink of a transformative change through an emerging initiative called "Conservation Without Conflict." Last year, a few folks such as Wendi Weber, Cindy Dohner, and James Cummins got together and concluded that working lands—farms, forests, ranches—need to work and that species conservation needs to be achieved, especially given that there are more than 500 at-risk species. This work will not get done without all voices coming together. This is a unique moment in time, an opportunity to transform how business is done; and it may take a few years, but it will be possible because those involved seek to include all voices, to involve private landowners, as equal partners in achieving conservation success.

Having a voice is one thing; listening to that voice and taking in what you hear is another. As leaders in the community, listening, learning, and building efforts together can be difficult, but we all have the ability; and tomorrow is defined by what we do today.

The Role of Business in Conservation

Regardless of people's backgrounds and experiences, within the conservation community and across other industries, there is one important common thread: the need for change and how to do things differently to create better results. From a business perspective, Sheryl Corrigan observes that every day people are forced to consider the question: do we need to change? In her estimation, change requires thinking about how to do things differently to create better results.

Corrigan serves as the director of environment, health, and safety for Koch Industries with oversight in compliance, regulations, and internal policies. With strong roots in the Midwest, she has moved between government and industry sectors in her career, having served as commissioner for the Minnesota Pollution Control Agency as well as with 3M in positions focused on environmental issues. Corrigan resides in Wichita, Kansas.

At Koch Industries, when faced with the question of needing to change, the company goes back to fundamentals: Why are we here? What is it that we do? Koch asks these questions often, and in an even larger sense, considers the question: why does business really exist? Most people would answer that business exists to make money. However, the reality is that business—today and for thousands of years—exists to create value for people and to make lives better.

So, how does Koch Industries make life better? Well, for example, Koch Industries owns Georgia Pacific, which means if you went to the bathroom today, your life is better because of a product her company makes. Koch also owns another company, Molex Inc., an electronics company that makes the connectors for Apple iPhone chargers. That's what business does—it identifies the things that people need and want and finds a way to make them using the fewest resources possible. That's how business creates value; it's why business is here.

The question is: how does *your* organization create value for people? Not just for the landscape. It's important to consider how the conservation community is creating value for society, creating value for the people, and how conservationists are taking that forward to create results that are meaningful on a large and small scale. In business, there are a lot of great, smart people thinking about this every day; and the same thing is happening in the nonprofit and in the government sector—every day, everyone in the

wildlife and natural resources community is waking up asking: how do I get better results for the sage-grouse? How do I get better results for whatever project it is you're working on? The focus has to be how to collaborate better—and with nontraditional partners. Business has a role to play because there are so many smart people coming up with smart solutions and making profit; and that profit can be applied to the projects and things being worked on if there is an aligned vision.

In 2016, about $1 trillion of the GDP was government, $3 trillion was the nonprofit sector, and $20 trillion was the private sector. If complex problems—like sage-grouse, conservation, and environmental challenges—are going to be solved, people must work together across sectors. It's not enough for government and nongovernmental organizations (NGOs) to work together—the resources aren't there. Business and the private sector need to be brought into the equation with an understanding that, while not everyone has to agree on everything, there does have to be a shared and aligned vision in order to move forward together.

As former commissioner of the Minnesota Pollution Control Agency, Corrigan found herself dealing with substantial potential air quality problems in the greater Minneapolis area. As the issue became increasingly problematic, she talked with many people in her agency and determined that the issue could not be solved by applying traditional regulatory approaches. Instead, smaller projects with nontraditional partners needed to be implemented. That's how Project Greenfleet, focused on retrofitting diesel school buses to reduce air pollution, was conceived. Corrigan called industry leaders in the Minneapolis-St. Paul metropolitan area and asked them to take part in the effort by donating equipment and seed money to get the work done on the buses; she also invited NGO Minnesota Environmental Initiative to coordinate the effort. The project launched 10 years ago with a handful of school buses. Today, all Minnesota school buses, as well as major construction equipment and marine vessels, have been retrofitted, resulting in a reduction of air pollution by the equivalent of 750,000 cars—all because of an environmental challenge, an idea, and nontraditional partners who agreed to move forward with one common goal.

Corrigan encouraged us, the conservation community, to consider *our* Project Greenfleet, *our* Louisiana black bear effort, and how to bring in business to resource the challenge, develop solutions, and scale up results.

Collaborating When Conflict Already Exists

Basketball coach Phil Jackson talks about not just developing a team but looking at individual members of that team and considering the roles each can play to become a winning team. That's what Francine Madden does as cofounder and executive director of the Center for Conservation Peacebuilding (C-Peace), an organization with a mission to transform social conflict to create lasting solutions for people and wildlife. Madden began her career in conservation conflict transformation leading efforts to address community conflict with mountain gorillas in Uganda and Rwanda, and during the past 20 years, has led conflict transformation efforts across the globe resulting in numerous publications. In those efforts, Madden has worked successfully as a neutral third party to improve relationships between citizens and government through local community decision-making processes that address the deeper roots of conflict. She resides in Washington, DC.

Conflict is part of the DNA of being in human community—you can't have a relationship with your partner, spouse, child, neighbor, or society without conflict being part of it. The foundation of the work C-Peace does in conservation conflicts is adapted from the peacebuilding field in which conflict is seen as an opportunity to take the energy that fuels the conflict and transform it into effective collaboration and positive change.

Recently, C-Peace worked on the wolf conflict in Washington state. When C-Peace was brought in, the conflict was at a very destructive point; there were a number of processes going on, one of the more pronounced being an advisory group of hunters, livestock producers, and environmentalists giving advice to the state wildlife agency. Madden was told there had been a lot of bullying, shouting, and undermining taking place. But magic won't happen in a room when conflicting parties are brought

together unless groundwork has been done individually beforehand. So, Madden spent about four months working behind the scenes with the interest groups.

In May 2015, when Madden brought the reformed group back together, the dynamic had completely changed—livestock producers and environmentalists who couldn't speak civilly to one another were laughing and having conversations; an animal rights vegan was staying up late drinking whisky and getting along with a livestock producer. Relationship building is great—and trust can be built a lot faster with relationship; but by changing the nature of the advisory group to be more shared problem solving, within six meetings, the reformed group of 18 stakeholders and 12 department staff had reworked three years of contentious issues around the question of when it was appropriate to use lethal removal of wolves. At that sixth meeting, when they had to come up with a policy, it was no longer each side advocating for their own purposes; it was the livestock producers advocating for what the environmentalists wanted and the environmentalists advocating for what the livestock producers wanted. Instead of advocating for what each side wanted, they were advocating for what the other side needed in order to reach an acceptable solution for all.

Successful conflict transformation is, at its essence, about reaching deep to explore identity conflicts among participants—it's not just what's on the surface (wolves, cows, ungulates), it's about deeply rooted identity level conflict where each group feels their way of life is under threat, including government agency representatives who also may find themselves in conflict situations where our professional identity feels questioned or under attack, which may hamper efforts in achieving lasting solutions. People bring their human needs to the table, perhaps unconsciously. Underlying issues that stymie solutions can often be about how we view our own identity, the need for recognition, and the very human need to be part of decision-making for issues that will affect us or our way of life. It can be about belonging to a group. It can also be about the importance of place (an attachment to the land) and the ability to reach one's potential.

A year later, Madden checked in with the group to see where things stood, taking time to speak with each individual, and one of the hunters said, "We just got really lucky with this amazing group of people." She wanted to know how he'd arrived at that conclusion given that the same group had been attacking each other three years prior! As a new member of the group, he wasn't sure. The answer is really in the process; the process is the foundation, the bedrock—design a really good process that's positively centered that allows those identity conflicts to be reconciled, but that also enables forward movement toward the future desired state. Allow for problem solving while building relationships at the same time—it's not luck. People are actually really good people, and if you design a process to bring out people's better selves and design it for that collaboration, then people can do amazing, inspiring things together.

Madden emphasized that another important factor to consider is that emotions *cannot* (and should not) be divorced from decision-making. Neuroscientists would say it is actually physically impossible to take emotions out; not only that, but emotions are a really good thing. Emotions speed up processing and reasoning, they speed up trust building, and they increase collective intelligence. People should want emotions in decision-making; you can't not have them and you really actually want them because they improve situations. People often fight, whether over wolves or bears or sage-grouse or tigers or whatever it is; however, they are really bringing a lot of other human needs into the conversation. It's not just about that tangible natural resource issue; it's their identity, their need for recognition, their need for meaningful participation in decisions that affect them. It's about group belonging. It's about the importance of place and an ability to reach one's potential. Those needs can be addressed through the process and the relationship; it doesn't all have to come down on the substance.

To make a collaborative approach successful, given her experience in transforming conflict, Madden urged groups and organizations to take these final thoughts into consideration:

- Start engagement around a conflict early. The process cannot be started "too early;" the initial engagement of involved individuals to understand the lay of the land takes time.

- Be aware of same-side conflict (i.e., conflict *within* a given group) because that internal conflict will fuel the external conflict—and unresolved conflicts within an agency or a given user group will hamper ultimate success.
- Genuine collaboration means giving up control. Giving up control is an essential precursor in order to eventually gain control, yet powerful interest groups and governments are reluctant to do so. It can be scary, but it works.
- Don't forget to play. Groups will build trust faster, be more creative, and make more sophisticated decisions together when the process involves some down time or opportunities for fun.
- Capacity building is critical. Everyone has an ability to work this way; it is not limited to a special talent possessed by a few lucky people. However, we need to build our capacity as individuals and together as a team, and that preparation period is critical.
- As the effort progresses over time, monitor for "social contagion," which is when the conflict transformation approach naturally spreads or is imitated elsewhere. If the work being done is not contagious—i.e., is not spreading to other issues—then it likely is not working. In the case of wolves in Washington state, the conflict resolution approach Madden led is spreading to management around cougars, bears, wildfire prevention, and domestic animal welfare. The contagious nature of this approach is proof that it is working.

Addendum

Engaging with Participants: Thoughts from the Room (Q&A)

Q: Having been away from the North American for 15 years, I find that many of the major concerns about relevancy and collaboration from years past are still being discussed today. How do we move beyond wanting to convert people to embrace the values shared at this conference and, instead, become more relevant by meeting people where they are and trying to understand how their perspectives, their innate values, and their visions are relevant to what we're doing? When do outside perspectives become valid and how do we broaden the conversation to include those perspectives?

> Often, we do try to change people's identity and values to try to get them to come along with what we think is right. The key to success is legitimizing and validating the values and identities of those groups and then creating a shared identity around something bigger. Too often, we've tried to replace people's identities, but that becomes a threat to their identity and when people's identities are threatened, they fight. We need to find—and build on—common ground so that we can coexist together. At the very essence of most conflicts, people think that they are right and everyone else has to join in. Instead, consider how different perspectives could deepen the conversation; develop a shared point of view; and figure out how to move forward. The key is that we don't have to agree on everything. We *do* have to agree on where we are headed, how we're going to get there, who's going to help, and how we're going to measure the process in order to achieve meaningful results.

Q: Changing the nature of an advisory group—I have been in some working groups that do work and some working groups that just don't work because of one or two members. Have you had experience where you have a member who really doesn't want to work, who wants to have it where the only compromise is if it's done their way? If that's the case, do you change the working group or how do you work through that dynamic?

> Take the Louisiana black bear, for example—everyone who came to the table to work for conservation of the bear agreed that their own bias would be left at the door. Yet, there were some

members who fell back on their bias, but the group ultimately self-regulated. Consensus is a marvelous thing; however, it is very difficult to achieve when there are one or two group members unwilling to shift their viewpoints. But the black bear group had strong buy-in to the collective purpose and did not encourage or tolerate bias. In the case of the wolf advisory group, however, nobody actually wanted to be at the table to begin with, much less to even be in the room because it had been so dysfunctional for so long. Collaborative groups have to find what brings people to the table, the hook that connects everybody. But collaborative groups also have to figure out what the decision-making process will be and how decisions will be made together—but time and time again, they fail to do this because it's hard. People often think consensus where everybody agrees is best, but the challenge with consensus is that there can be one or two people who hold up the entire process, giving that one person more power than the group as a whole. Instead, groups should work toward sufficient consensus, a decision-making process developed through apartheid in South Africa involving a robust, deep dialogue in which no one person has an overwhelming amount of power.

Q: From a government agency perspective, business can be scary. Koch Industries has a visible corporate identity that sometimes seems on the other side of conservation—is there any advice for how government agencies can engage companies like Koch Industries, with which there may not be any shared, common ground, to start building a more productive relationship?

In personal relationships, we have to do a bit of exploration and due diligence. We meet people everyday who we may have preconceived notions about, but as soon as we talk with that person, we realize our perceptions were misplaced. We need to do thoughtful research and challenge our personal biases—everyday we need to re-create and re-think who we are and how we're creating value. If we're not getting the results we want, then we've got to change our approach to create results.

Q: Sometimes the troubles and disagreements exist within our own agencies—a lack of staff to think about the future or be responsive. We don't have a lot of space for creativity and we don't hire for creativity, we hire for science. How do we work within and achieve consensus within so that when we are at the table with collaborators we can actually get something done?

State and federal fish and wildlife agencies often feel under attack, and when there is conflict and our identities are under threat, we fight and defend. That's why there's no creativity—it's hard to think proactively or creatively when we're getting hit from all sides. When there is identity conflict, groups migrate toward conformity and authoritarian rule—group members do whatever the leader says, no matter the consequences, and lose all creativity. It's a matter of balancing power internally, and it takes a lot of work in an agency to change the culture to welcome diverse internal views. Stakeholders are then more responsive because they appreciate the diverse views, and the results become a social contagion reinforcing the process. It's also important to recognize that leadership has many responsibilities, one of which is allowing your team to step back, take a deep breath, and envision the future and what they can do to make positive change. Finding time to think ahead can be transformational to a culture, but it requires deliberately freeing up time. To be successful, every team member must be engaged, which comes from taking the time to think deeply and creatively and ask the hard questions.

Closing Session: Where Can We Go Together From Here?

Noreen Walsh
U. S. Fish & Wildlife Service
Denver, Colorado

We titled the closing of this session "Where Can We Go *Together* From Here?" because we believe, as a conservation community, we can increase our effectiveness in using collaborative efforts at multiple scales, from a local to a national scale. There are so many important perspectives to consider as we ponder the numerous examples of good collaborative conservation and how we can become even better. But how do we get to that transformational change discussed here today?

Let me start with a "thank you" to all who spoke at this panel—your honest contributions make me hopeful, even in the face of the daunting challenges to our world that Ali Duvall spoke about in her opening session: the physical reality of human population growth and climate change and the urban nature of our populations, which have very little connection to the natural world. Also, socially, we are living in a time of increasing polarization, with deep and wide divisions. Does this too influence our organizational and individual patterns of thinking? Sometimes it's easy to view issues as simple dualities—hunters versus nonhunters, industry versus conservation, profit versus environmental sustainability, urban residence versus rural, and sometimes even state versus federal. When we think in that way, it limits our ability to truly craft effective solutions and a path forward where conservation remains relevant to all the people we serve in this country.

In opening the first panel about the successful bistate sage-grouse collaborative effort, Tony Wasley reminded us that we've already seen an evolution away from that myth that science and data will carry the day. We have seen ourselves, as a community, move away from that myth and evolve towards the acknowledgement that the human side of the equation is just as—if not more—important in everything we're trying to do.

Sherri Lisius, Susanna Danner, and Shawn Espinosa shared three key points from their experience with the very successful bistate sage-grouse collaborative effort:

1) The importance of hiring people into our agencies who bring collaboration skills, and then mentoring those new employees into the local scene. Lisius talked about how her manager had been in place for many years and took the time to introduce her to people and local customs.
2) The critical nature of inviting a wide diversity of partners to the table—everyone who had an interest or stake in the bistate sage-grouse issue was welcomed and needed in order to make the collaboration a success.
3) The importance of listening—not just talking, but truly listening with patience and respect to that wide diversity of partners.

These three points contributed to honest, gut-level engagement; the development of a shared purpose among the partners that was "boundary-blind"; and ultimately, lasting results for the partnership and its objectives.

In our second panel, Sheryl Corrigan shared a business perspective with us and the idea that the role of business is to make people's lives better. She made me ponder: Is it working—can business make a profit *and* contribute to the health of the planet? Yes, it can. But as a community of conservationists, we need to focus more specifically on the overlap between industry and conservation and look more purposefully at engaging with industry to try to capitalize on that partnership.

Corrigan also made me think that, in the end, the role of the *conservation business* is also to make people's lives better. As a conservation community, we have to ask ourselves: are we doing our very best in communicating that idea to the people we serve? We need to get better at communicating the why and how of our conservation work so that "the person on the street" better understand how our work positively impacts the lives of others and makes the planet healthier for everyone.

From the private landowner perspective, we were also reminded that sometimes when we think we've been inclusive, it's important that we double-back to ensure we haven't forgotten anyone. Jimmy Bullock shared an instance where private landowners were left out of the mix in an ongoing collaborative conservation endeavor—it was a powerful example of it being worth double-checking whether all partners are at the table so that no involved groups are left out.

Bullock also shared his perspective about the growing coalition Conservation Without Conflict comprised of folks united by a value for the land. Some, but not all, of those values revolve around wildlife and a very human desire to pass on benefits to future generations. It's a remarkable example—"transformational," Bullock called it—of what can happen when we look for the overlap among our values instead of focusing only on our differences.

From Francine Madden, we heard that deep conflicts around wildlife are often emblematic of broader societal conflicts—and that *those* are really about deeply held identities and values being threatened. Her thesis was that until those underlying values are acknowledged and dealt with, it's unlikely the problem that initially brought everyone to the table will be resolved. Digging into identities and values, sharing emotions, and giving up control can be a scary proposition to many of us more comfortable with data and process. However, what Madden shared from her experience is that there is no magic-bullet shortcut to dealing with those things—we have to actually walk through the fire and come out the other side to become successful co-collaborators where conflict is involved.

Though hunting was not discussed at length in today's session it's important to keep in mind, given that we sometimes, within the conservation and wildlife community, mentally divide the world into hunters and nonhunters. During the comment session, an audience member posed a question meant for self-reflection: "When we are talking about collaboration, are we really just trying to convert people, to bring them around to our way of thinking?" That led me to question: As conservationists, most of whom support and identify with consumptive use of wildlife, can we acknowledge the identity—can we honor the values—of those who don't hunt but who do care about wildlife? Do we dare walk through that fire, seek to understand their identity, and bring them and their values more fully into the conversation? And if not, will we ever get to a place where we can build on the things we both care about: healthy habitats and robust populations? Can we work through this in a way that honors and preserves the proud traditions of the past while growing into a system that welcomes diversity in thoughts, perspectives, backgrounds, and values? We must. If we don't aggressively capitalize on the fact that consumptive *and* nonconsumptive users care about the health of our habitats, then the growing number of people on this planet who don't care *at all* about these issues will outnumber our voices, making us irrelevant.

We see more and more examples of successful local and regional scale collaborative efforts (e.g., the Blackfoot Challenge, Western Landowners Alliance, High Divide Collaborative, The Florida Conservation Group). Many of these collaborations got started around a kitchen table or in a local community hall, but they got traction because participants committed to this idea of listening to and respecting each other and then did the hard work of building something together that they could *all* support.

Can that growing movement of local collaborative efforts inspire us at the national scale of our profession as conservationists? What is at risk if we don't continue a transition to more inclusive and collaborative ways of doing business? More importantly, what could we gain? We could gain allies and strength in numbers. We have many skilled individual leaders moving us forward in conservation. But can we shift our lens to create a larger *collective* of leaders, a *system* of leadership that will create a future for conservation where our values are still relevant? Peter Senge and his colleagues (Senge et al. 2015) have shared a concept they call "system leadership" and hearken to an ancient understanding of the word "leadership" that has, at its root, the verb "to lead" ("*leith*"). Leith meant to literally step across a threshold—and to let go of whatever might limit our ability to step forward. Their work was not specifically about conservation. However, similar to today's discussion, these authors argue that we face a plethora of deep and systemic challenges in the world today—all of which reach beyond the boundaries of any one organization or institution. Furthermore, they argue that many collaborative efforts flounder because they fail to foster collective leadership not only within but also across collaborating

organizations. What we heard from the bistate sage-grouse case study shows that when we do reach beyond our own organization and create a collective leadership system across all partners, success is within our grasp. So how do we scale it up, beyond the local to the level of our conservation community?

Developing true system leaders requires investment in three core capabilities (Senge et al. 2015):

1) The ability to see the larger system of which each individual or organization is a part, thus enabling the development of solutions not evident to any one of them individually.
2) The ability to foster reflection and generative conversations; deep, honest, shared reflection and true listening to points of view different than one's own.
3) And perhaps most importantly, using the first two abilities to shift the focus away from problem solving to cocreating the future. That is, moving beyond simple reaction to a problem to building positive visions for the future.

These authors conclude that transforming systems is ultimately about transforming relationships among people who shape those systems. They argue that when we grow together as a *network* of leaders across organizational boundaries only then can we actually begin to see novel solutions to complex problems being borne out of deep, honest, shared reflection. When we come together across organizations in that way, we can shift the focus away from mere problem solving to a focus on cocreating the future.

That kind of system leadership starts with us. If we want to build conservation efforts that last, then we are the ones who will need to come together, but it is not only us. Look around. We are missing some folks. We will need to be inclusive, inviting unique voices and underrepresented groups, and then we will need to listen deeply and share honestly to ultimately build a vision for cocreating the future.

We are grateful to Wildlife Management Institute, Steve Williams, and all the organizers of the 83rd North American Wildlife and Natural Resources Conference for their willingness and leadership to create space in this historic forum for discussions about continuing growth and change in the conservation community. As organizers of this session, we believe that greater success in collaboration with diverse people representing diverse interests at multiple scales is necessary for the conservation community to remain relevant into the future.

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Special Session Two.
The Southeast Conservation Adaptation Strategy: A Model for Collaborative Conservation

Introduction of SECAS and SENRLG

Susan Gibson
Department of Defense
Atlanta, Georgia

As the Department of Defense (DoD) regional environmental coordinator for the southeast, I represent the federal agencies and military services in relation to the Southeast Conservation Adaptation Strategy (SECAS) and the Southeastern Natural Resources Leaders Group (SENRLG). With the retirement of Cindy Dohner as U.S. Fish & Wildlife Service (USFWS) regional director, I was asked to fill in for her and her role as the liaison with SENRLG. SENRLG is comprised of 13 federal agencies, all sharing a natural resource mission with a 25-year history of collaboration. The agencies include USFWS, U.S. Geological Services; U.S. Forest Service; National Park Service; DoD; National Oceanic and Atmospheric Administration; National Resource Conservation Service; Environmental Protection Agency; Bureau of Ocean Energy Management; Federal Highway Administration; Tennessee Valley Authority; Federal Emergency Management Agency; and the U.S. Army Corps of Engineers. SENRLG is a unique partnership of the senior leadership of these organizations, meeting twice a year to discuss opportunities for collaboration, lessons learned, and issues on the horizon. It also serves to develop relationships between agency leadership.

In the 15 SECAS states, we have more than 4.2 million acres of DoD land. Southern states are very different from the training lands out west. In the southeast, about 94% of our land is privately owned; western lands have a preponderance of federal ownership. So, it is critical to the mission of DoD in the southeast to keep these lands healthy. Our mission requires us to train sailors, soldiers, airmen, and Marines—we must train as we fight. Land management and natural resource considerations are critical to keep our limited training lands healthy and sustainable.

We all recognize there will never be enough money, never enough people, and never enough time to execute our agency mission to its full capacity. We all have new requirements, new laws, more regulations, and new agendas that require us to be flexible, responsive, and innovative. Is SECAS just one more thing we don't have time for? I'm here to convince you that SECAS, the Landscape Conservation Cooperatives, and the SECAS Blueprint (Blueprint) are time well spent.

As the SECAS coordinator to SENRLG, my goal is to keep leaders in the federal agencies apprised of the needs and focus of SECAS. SECAS provides state and federal partners with solid research, aligning methodologies, funding, and priorities. Senior leaders agree they can't succeed in conservation as a single agency. Any agency must have partners and collaboration with state, federal, and the private sector. If senior leaders in SENRLG commit to using the Blueprint as a starting point, we have a tool to begin our discussions and base our decisions on, leading us to landscape-scale conservation success.

SECAS and the Blueprint provide us with a framework for solid research to assess species. The Blueprint provides a tool to help us decide which habitats or ecosystems to focus on with limited funds. We can identify which investment contributes the most to biodiversity. We won't know unless we bring our partners to the table and start a conversation with a scientific tool, like the Blueprint, on how we can best collaborate, make meaningful cost-effective decisions, and keep our respective natural resource missions in compliance.

We all participate in partnerships that emphasize landscape-scale conservation, such as Partners in Flight, Southeast Regional Partnership for Planning and Sustainability, Western Regional Partnership, Gulf of Mexico Alliance, Chesapeake Bay—and the list goes on. All of these partnerships have been

productive. But think of the time that could have been saved if we had started these partnerships by rolling out the Blueprint, "the Good Map," as our foundational document. We would know our partners contributed to the success of the Blueprint—that they are committed to partnership through their SECAS involvement and were willing to collaborate to achieve a collective success.

Military installations must have state and federal partners at the table to keep from being the last remaining habitat for a species. SECAS provides that partnership that combines science and collaboration.

If we only work with people we know, we won't grow in this region. We need new advocates outside the installations, outside the state resource agencies. I ask all of you to find new partners in areas such as the economy, sustainability, recreation, and quality of life. The presenters today will give you that perspective. Let's all work outside the fence line to achieve mission goals for all the partners at the table.

Developing and Implementing the SECAS Blueprint

Mallory G. Martin
U.S. Fish & Wildlife Service
Raleigh, North Carolina

This presentation provides background on the Southeast Conservation Adaptation Strategy (SECAS) initiative and, specifically, overviews development of the SECAS Blueprint (Blueprint). The SECAS Blueprint is a spatial representation of the collective conservation vision of multiple state and federal partners and other entities participating in the SECAS initiative. Additional emphasis and explanation is provided on implementation of the SECAS Blueprint, priority Blueprint improvements, and expanding connections to nontraditional economic sectors and to adjoining regions outside the southeastern U.S.

What is driving the need for landscape-scale conservation in the Southeast? Simply put, the scope and scale of the challenges facing wildlife conservation are of a magnitude that no single agency or organization can address them alone. Moreover, these challenges are manifest across multiple jurisdictional boundaries, where individual agency responsibilities or authorities may not be relevant. These large-scale challenges include urbanization, energy development, climate impacts, and water stress. Looking at urbanization impact alone, we have the benefit of hindsight that can help us realize how development has affected the extent and quality of wildlife habitat in the Southeast since 1940. Looking forward to 2030, we have the benefit of technology and collaboration potential to help define a sustaining landscape for the future so that wildlife doesn't just get what is left over from development.

The need for SECAS arises from these dramatic changes and unprecedented challenges on the landscape. However, SECAS also offers a clear opportunity for the future, based on coordinated action around a shared long-term vision involving diverse partners, resulting in a regional conservation future that can sustain wildlife in a coordinated, nonrandom fashion.

SECAS was initiated in fall 2011 by the directors of the state fish and wildlife agencies of the Southeastern Association of Fish and Wildlife Agencies (SEAFWA) who came together to address the question of how to define and achieve a landscape condition that sustains natural resources for the future in the Southeast and Caribbean. Concurrently, the state directors asked the six Landscape Conservation Cooperatives (LCCs) active in the southeast to work with state agency contacts and other partners to provide the technical capacity and coordinating functions to advance a regional strategy for conservation. In spring 2012, those directors approached the federal Southeast Natural Resource Leaders Group (SENRLG), inviting their participation in the SECAS initiative. Thereby, SECAS was established with the following key characteristics:

- SECAS is a state-led initiative.
- It is inclusive of the federal natural resource management agencies.
- The technical capacity and coordination for planning and implementation come through LCCs.
- Work is coordinated with Climate Science Centers, Joint Ventures, and Fish Habitat Partnerships.
- The initiative incorporates a broad network of partners and sectors.

Since 2011, this broad partnership established by the SECAS initiative has been focused on the following collective vision:

> Through SECAS, diverse partners are working together to design and achieve a connected network of landscapes and seascapes that supports thriving fish and wildlife populations and improved quality of life for people across the southeastern United States and the Caribbean. Together, federal, state, nonprofit, and private organizations are

> coordinating their conservation actions and investments to focus on common goals.

To move forward toward realization of the collective vision, it is necessary to have a good map. The SECAS Blueprint is that good map. It is a spatial representation of the collective vision for the future of natural resources in the Southeast. It is also a living map that depicts the shared priorities for conservation and restoration on the landscape, not an acquisition boundary. The Blueprint integrates other blueprints and conservation planning tools and products of the LCCs covering the Southeast, thereby identifying opportunities for cross-border collaboration to influence those cross-jurisdictional challenges affecting conservation in the Southeast. The SECAS Blueprint is also intended to be updated regularly, contributing to a culture of continuous improvement (Figure 1).

The SECAS Blueprint stitches together the work of multiple LCCs into a map of shared conservation and restoration priorities across the Southeast and Caribbean. The Blueprint combines multiple data sets, tools, and resources into one cohesive map that can be referenced and shared by regional planners, highway departments, developers, businesses, and conservation professionals alike. By providing regional context for local decisions, it will help organizations with different goals find common ground—opportunities to align their efforts to protect fish and wildlife habitat, improve quality of life for people, safeguard life and property, and develop strong economies. As the Blueprint informs the decisions affecting our communities, our livelihoods, and our natural and cultural heritage, it will shape a more sustainable future across the entire southeast region.

Literally thousands of people representing hundreds of diverse organizations have actively participated in developing the components of the SECAS Blueprint to date. It incorporates the best available information about the condition of key species and habitats, as well as future threats. Because the Blueprint is a living document, these mapped priorities will evolve over time, driven by improvements to the underlying science, our growing understanding of on-the-ground conditions, and input from new partners.

The Blueprint shows priority areas across a 15-state regional boundary and is being used to answer questions about:

- Connecting lands and waters across the 15-state Southeast region;
- Engaging other nontraditional sectors into conservation actions;
- Incorporating future conditions into current decision making;
- Integrating at-risk species distribution, habitat, and condition;
- Acquiring new resources for regional conservation action; and
- Using existing conservation resources and capacity more efficiently and effectively.

The "blue" areas of the SECAS Blueprint represent areas of high conservation value within the Southeast region and were integrated across multiple LCCs through a consensus approach among the points of contact from the SEAFWA and SENRLG member groups. The blue areas are not intended to describe an acquisition boundary, nor are specific conservation outcomes identified for all blue areas—i.e., the Blueprint is nonprescriptive in regard to actions in any specific area. However, a suite of common conservation strategies and actions has been identified for portions of the Blueprint that can broadly apply to the high conservation value areas in the entire SECAS Blueprint (South Atlantic LCC 2015). Several examples of completed, ongoing, and planned uses of the SECAS Blueprint are archived on the SECAS website. From that website, access is provided to the Southeast Conservation Planning Atlas, a platform for data analysis and mapping where users can retrieve and perform analyses on spatial information related to their specific conservation goals.

Priority actions for updating the SECAS Blueprint include incorporating the most recent data sets, improving consistency across the full SECAS geography, and creating tools to help users filter the Blueprint for specific applications. Additional emphasis is being placed on improving the priority hubs

and corridors layer, improving integration of at-risk species modeling to help refine prioritization, and integrating species of greatest conservation needs from individual state wildlife action plans.

Additional regional refinement is being considered for report-card type assessments of habitats and subregions, similar to the "State of the South Atlantic" publication that describes the ecological health score of ecosystems and habitats in the South Atlantic LCC geography (South Atlantic LCC 2015). Other, similar approaches have been undertaken for additional subregions of the SECAS geography, including the Tennessee River Basin and its report card for aquatic resource health. These subregional health assessments can serve as a baseline to help quantify the impacts of specific conservation actions and to identify specific areas needing improvement.

The SECAS Blueprint results from a broad collaboration of diverse conservation partners across the Southeast. These partners are engaged in promoting awareness of the Blueprint, supporting a diversity of its uses and application, and improving the robustness and precision of the Blueprint's constituent components. Elements of this Blueprint can be integrated with similar efforts at a larger national scale, such as the Nature's Network initiative in the Northeast and the Crucial Habitat Assessment Tool in the West, to define a seamless network of conservation priority and opportunity for the entire nation.

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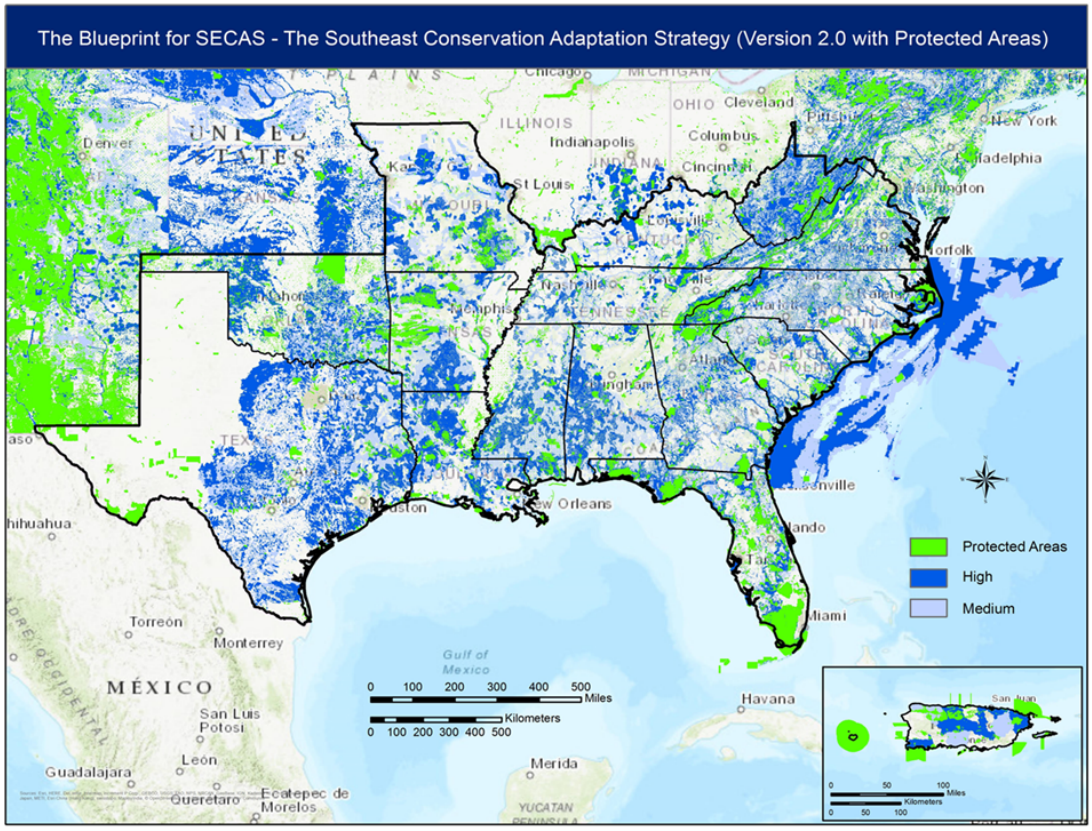
Figure 1. The SECAS Blueprint, version 2.0 (source: Southeast Conservation Adaptation Strategy website).



SECAS Case Studies

Chris Goudreau
North Carolina Wildlife Resources Commission
Marion, North Carolina

The previous presentations provided brief overviews of why and how the Southeast Conservation Adaptation Strategy (SECAS) came to be and the development of one of its most important products—the SECAS Blueprint (Blueprint). Here, I provide some brief examples of how the Blueprint and other SECAS tools have been used by various entities to advance conservation efforts in the Southeast.

There are a number of ways that SECAS and the Blueprint can be used to assist with large-scale conservation. As mentioned in the previous talk, these include: conserving and connecting lands, conserving and connecting waters, engaging other sectors, incorporating future conditions into decision-making, integrating at-risk species, and bringing in new resources. Another way that SECAS is assisting conservation is by integrating social sciences, such as governance and decision frameworks, into the process. This is particularly important when dealing with multiple partners with different mandates across varying jurisdictions.

Early Successes

Even though not all parts of the Blueprint were ready at the same time, practitioners started using available tools for planning and analyses. At the Landscape Conservation Cooperatives (LCCs), there were dozens of projects beginning around 2012.

The first example was conducted by the Gulf Coast Prairie LCC from 2012 to 2014, which was directed at conserving grassland-shrubland prairie in parts of Oklahoma and Texas. Focal species associated with these habitats included black-capped vireo, Bell's vireo, and painted bunting, but the analysis also incorporated impacts to other managed species, such as northern bobwhite quail, white-tailed deer, and wild turkey. The project produced a web-based spatial tool that synthesizes the status, threats, conservation opportunities, and potential of habitats and species. Taking a collaborative approach enables users to identify locations that match their conservation priorities and determine best management practices to reach those goals, with the common aim of conserving remaining prairie habitats.

On a broader scale, the Gulf Coast Vulnerability Assessment was performed across portions of five states from Texas to Florida. This project ran from 2012 to 2015 and was jointly funded by the Gulf Coast Prairie, Gulf Coastal Plains & Ozarks, South Atlantic and Peninsular Florida LCCs, and the National Oceanic and Atmospheric Administration. Across this extensive geographic area, participants agreed on modeling shared habitats, species, and issues. The following ecosystems and associated species were assessed using expert opinion: barrier islands (black skimmer, Wilson's plover, Kemp's Ridley sea turtle); tidal emergent marshes (mottled duck, spotted seatrout, blue crab, clapper rail); oyster reefs (Eastern oyster, American oystercatcher, red drum); and mangroves (roseate spoonbill). The analysis assessed the vulnerability of these habitats to threats, such as climate change, sea level rise, and urbanization, to the year 2060. Species vulnerability scores ranged from low (blue crab) to high (Kemp's Ridley sea turtle). Ecosystem vulnerability across the four systems differed less than it did for species, with mangroves being the least vulnerable and tidal emergent marshes being the most vulnerable. The Gulf Coast Vulnerability Assessment can be used to inform actions and link individual actions to support regional conservation and adaptation efforts by: identifying vulnerable species and ecosystems across the Gulf region; identifying the most common threats to species and ecosystems; identifying research gaps; and reevaluating vulnerability as new data become available.

The South Atlantic LCC provides an example of how landscape planning can bring additional resources to the region. The Wildland Fire Resilient Landscapes project managed by the Department of the Interior was originally focused solely on western states. Because the South Atlantic LCC had a

comprehensive plan that included longleaf habitats across multiple states, almost $3 million were directed to the Southeast from 2015 to 2017.

Thinking Bigger and More Connected

These early successes resulted in more use of conservation planning tools across even larger areas. Many of these uses needed the larger and more connected coverage of the full SECAS Blueprint. Examples described below include those from a single state, multiple states, and the entire Southeastern Association of Fish and Wildlife Agencies (SEAFWA) region.

In South Carolina, use of the SECAS Blueprint has been helpful to comprehensive conservation planning at the statewide and local levels. At the statewide level, the Blueprint is valuable for updating the list of Conservation Opportunity Areas described in the State Wildlife Action Plan and for aligning priority areas for multiple state, federal, and nongovernmental organizations (NGOs). The Blueprint is also helpful because it shows how the Conservation Opportunity Areas in South Carolina match up with similar areas in adjoining states. Having a single conservation framework is also very useful when applying to funding sources, such as the South Carolina Conservation Bank, to purchase properties or implement other management activities.

Use of the SECAS Blueprint has made it easier to determine oil spill restoration actions in the five-state Gulf of Mexico region. Although there is a large funding source, there are multiple state, federal, and NGO entities with differing objectives and priorities. Also, many state fish and wildlife agencies are often not considered the lead state entity in the decision process. Having a common, integrated framework with data-driven predictions of conservation impact has helped make restoration funding proposals more competitive.

On an even larger geographic scale, there are two uses of the SECAS Blueprint that cover most, or all, of the southeastern states. Longleaf pine savannah ecosystems are native to nine of the 15 southeastern states, covering an historical range of 92 million acres. Restoration of these habitats is a goal throughout the region, with at least 17 local implementation teams established. Determining priority locations to conduct restoration efforts in such a large area is very important to increase the probability of success and to ensure that funds are spent wisely. The National Fish and Wildlife Foundation is requiring the identification of focus areas, but many implementation teams haven't developed them yet; so The Longleaf Alliance is using the Blueprint to help local implementation teams determine priority areas.

Similarly, all 15 southeastern states have goals to maintain, manage, and restore forest habitats as part of the Keeping Forests as Forests Initiative. The SEAFWA Forest Land Resources Committee echoes this overarching goal, but with so many forest types over such a large area, there is a crucial need to focus efforts on highest priority sites. The SECAS Blueprint is an excellent tool to identify such priority areas for more detailed analyses.

Other Projects in Progress

Lastly, the Blueprint is being considered in a number of other efforts in the planning stage. The Southeast Regional Partnership for Planning and Sustainability (SERPPAS) fire working group has been using the SECAS Blueprint to identify priority areas for prescribed fire in the Southeast. The concept is that SERPPAS organizations—including state fish and wildlife agencies, state forestry agencies, Department of Defense, Natural Resources Conservation Service, and others—will align their resources around those priority areas.

SEAFWA's Wildlife Diversity Committee is considering the development of a regional Species of Greatest Conservation Need list similar to a successful effort conducted by states in the Northeast. SECAS is excellently poised to assist with that process.

Finally, the SECAS Blueprint and other tools can be used to determine where and how land can be managed to provide secondary benefits and ecosystem services. For example, the amount of water saved through management of longleaf pine forests could be used for other uses, including meeting

human water needs in over-allocated systems. The value of the water could be used to fund land conservation and management. The major barrier has been predicting how much water would be saved in a given location. SECAS is helping develop models to predict water savings and provide information needed to use funding targeted toward water conservation for longleaf pine management.

But What About the People? The Role of Green Infrastructure

David Rouse
American Planning Association
Washington, District of Columbia

The Southeast Conservation Adaptation Strategy (SECAS) is a collaboration to define the conservation landscape of the future in the southeastern United States. Urban development and growth of metropolitan areas such as Atlanta, Charlotte, and Houston have had and will continue to have profound impacts on that landscape. Therefore, it is important to consider how those impacts can be mitigated and how a network of conservation lands and resources can connect rural, suburban, and urban areas across the region. Urban planners can play a key role in establishing such a network, using green infrastructure as a unifying concept that emphasizes ecosystem services and the benefits that natural lands and resources provide for people.

Growth Trends in the Southeastern United States

The Center for Regional Growth and Quality Development at the Georgia Institute of Technology and the Federal Highway Administration have identified 10 megaregions that contain more than 75% of the U.S. population and jobs and within which more than half of the country's population growth and an estimated 65% of economic growth is projected to occur between now and 2060 (Figure 1). Three of these megaregions (Piedmont, Florida, and the Texas Triangle) are located entirely within the southeastern United States, while a fourth (Washington, DC-Virginia) extends into northern Virginia. Analysis of growth and economic development trends show that the Southeast's population grew at a rate roughly 40% faster than any other region during the past six decades. Looking towards the future, the Piedmont megaregion's 2000 population of 47 million is projected to grow to 82 million by 2050. The implications for conservation include habitat fragmentation, stresses on natural ecosystem, impacts on air and water quality, and more.

Green Infrastructure

The term green infrastructure originated in the Southeast; the Florida Greenways Commission first used it in a 1994 report on land conservation strategies. The intent was to elevate the societal value and function of natural lands and systems to the same level of importance as built, or "gray," infrastructure (e.g., water, sewer, and roads):

> The Commission's vision for Florida represents a new way of looking at conservation, an approach that emphasizes the interconnectedness of both our natural systems and our common goals and recognizes that the state's "green infrastructure" is just as important to conserve and manage as our built infrastructure (Florida Greenways Commission 1994).

Currently there are two definitions of green infrastructure in common usage. Derived from the Florida Greenways Commission's vision, the first definition emphasizes a network of natural lands and resources at a regional or citywide scale:

> A strategically planned and managed network of wilderness, parks, greenways, conservation easements, and working lands with conservation value that supports native species, maintains natural ecological processes, sustains air and water resources, and contributes to

> the health and quality of life for America's communities and people (Benedict and McMahon 2006).

More recently, a second definition of green infrastructure evolved from the need to address the water-quality impacts of urban stormwater runoff in response to the Clean Water Act and related regulatory mandates. The U.S. Environmental Protection Agency (EPA) defines green infrastructure as follows:

> An adaptable term used to describe an array of products, technologies, and practices that use natural systems—or engineered systems that mimic natural processes—to enhance overall environmental quality and provide utility services. As a general principal, Green Infrastructure techniques use soils and vegetation to infiltrate, evapotranspirate, and/or recycle stormwater runoff. When used as components of a stormwater management system, Green Infrastructure practices such as green roofs, porous pavement, rain gardens, and vegetated swales can produce a variety of environmental benefits. In addition to effectively retaining and infiltrating rainfall, these technologies can simultaneously help filter air pollutants, reduce energy demands, mitigate urban heat islands, and sequester carbon while also providing communities with aesthetic and natural resource benefits (EPA n.d.).

These two definitions have two key characteristics in common. The first is the notion that green infrastructure provides ecosystem services and benefits for people. The triple bottom line of sustainability—environment, economy, and equity/community—can be used to organize the multiple and synergistic benefits that green infrastructure can provide, which are often termed cobenefits (Figure 2). The second is the notion that green infrastructure is spatially manifested on the landscape. This is particularly evident in Benedict and McMahon's (2006) definition, which references predominantly natural and rural resources (wilderness areas; working lands—i.e., farms and forests; greenways; etc.). The EPA definition refers to smaller-scale, human-made landscape features, predominantly used in urban areas that, except for porous pavements, incorporate natural elements (green roofs, rain gardens, and natural features).

This paper's premise is that there is no clear distinction between the two definitions, which can be viewed as forming a continuum across a regional landscape from rural to suburban to urban, with the spatial manifestation of green infrastructure becoming progressively more fine-grained as development density increases. In this context, note that Benedict and McMahon's (2006) definition refers to parks, whose size, use, and provision of natural habitat vary widely within a region (e.g., regional parks vs. urban parks) and which can play an important role in stormwater management at different scales and in different contexts. Viewing green infrastructure as an interconnected network across the landscape, which provides benefits for both natural ecosystems and people, can provide a conceptual framework to extend the conservation mission of SECAS into suburban and urban areas. Such an approach can help build a constituency for maintaining the quality of the Southeast's natural lands, wildlife, and water resources, at the regional and megaregional scales, as growth and development continue.

The Role of Urban Planners

Urban planners influence landscape change in the Southeast and elsewhere in the U.S. through their roles in long-range planning, development review and approval, and capital improvement programming by local governments. They often act as conveners, bringing together representatives of different professional disciplines, interests, and stakeholder groups to address common issues of concern (similar to the SECAS model of collaborative conservation). While planners are generally sympathetic to conservation, it is typically one of many competing priorities in the political environment in which they

work. In an era of shrinking resources at all levels of government, the elected officials to whom planners ultimately report are particularly concerned about the fiscal impacts of their decisions and the effects of conservation (and other activities) on the bottom line. They are also sensitive to the concerns and priorities of their constituents. From this perspective, green infrastructure is a potentially powerful concept that resonates with planners and can be used to advance conservation goals while achieving cobenefits important to local decision-makers and citizens. Examples of these cobenefits include economic development, stormwater management (particularly if it fulfills federal or state regulatory mandates), improved public health, and fiscal savings for local governments.

Integrating Urban Planning with the South Atlantic Conservation Blueprint

Developed by the South Atlantic Landscape Conservation Cooperative (LCC), one of several LCCs covered by SECAS, the South Atlantic Conservation Blueprint (Blueprint) is a "living spatial plan" that identifies shared natural and conservation resource priorities across a region extending from southern Virginia through North Carolina, South Carolina, and Georgia to northern Florida (Figure 3). It is located within the Coastal Plain and Piedmont ecoregions and contains the Atlanta, Charlotte, and Raleigh metropolitan areas, which are major population centers in the Piedmont megaregion.

Version 2.2 of the Blueprint was released in November 2017. Its development has been a collaborative process, with the active participation of approximately 500 people from more than 150 different organizations. However, planners from urban areas within the South Atlantic have had limited engagement in the Blueprint to date. Therefore, the South Atlantic LCC asked the American Planning Association's (APA) Green Communities Center to work with the LCC to "examine how large-scale green infrastructure definitions can be bridged…and identify areas of shared conservation interest across the rural-urban continuum" (APA n.d.). As indicated by this purpose statement, the project used the green infrastructure concept to bring together the South Atlantic's planning and conservation communities to explore how the Blueprint's natural and cultural resource priorities can be integrated into planning activities across rural, suburban, and urban areas.

In August/September 2016, APA conducted interviews with 24 conservationists, planners, engineers, and parks professionals across the South Atlantic to gain a better understanding of how green infrastructure and conservation practices are prioritized and implemented in the region. In September 2016, the South Atlantic LCC and APA brought together urban planners and conservation professionals representing 17 organizations throughout the South Atlantic at the Atlanta Botanical Garden to discuss challenges and opportunities for collaboration to meet shared goals. Table 1 provides a summary of the major challenges to conservation identified by conservationists and planners, respectively. Conservationists emphasized factors related to the need for coordination and education as the biggest challenges. Planners identified a range of factors related to their roles in local municipal government, including development pressures, private property rights, funding availability, and political will, among others.

Conservationists and planners were also asked to identify effective strategies to limit or mitigate development impacts on natural resources (Table 2). Conservationists identified zoning and tax incentives as the most effective strategies. Perhaps cognizant of the limits of zoning, which can be changed to accommodate development, planners identified permanent protection through land acquisition and conservation easements as the most effective strategies. Planners also identified public education as being important to support conservation.

The final product of this effort will be a report (currently under development) on how planners can use the South Atlantic Conservation Blueprint to improve the integration between the natural and built environments in local communities within the region. The report will cover:

- how conservation activities can provide cobenefits that help accomplish planning goals such as economic development, social equity, and community health (i.e., the green infrastructure concept);

- the benefits of intrajurisdictional and regional coordination to create a landscape-scale green infrastructure network;
- how planners can use and contribute local data to the Blueprint to improve its utility; and
- specific planning activities that can be informed by the Blueprint to advance conservation goals and community cobenefits.

The core activities of planners who influence landscape change are: 1) developing long-range plans, typically with community involvement, that guide policy and decision-making by local governmental officials; and 2) implementing plans through development regulations and incentives, capital investments, and programs. These activities provide opportunities to address conservation priorities, such as those identified by the South Atlantic Conservation Blueprint. Plans that can incorporate conservation data and advance conservation goals include, among others, comprehensive plans; park, recreation, and open space plans; green infrastructure plans; climate action/adaptation plans; transportation/mobility plans; watershed plans; and small area, subarea, and district plans. As the leading policy document guiding the long-range development of local jurisdictions across the United States, the comprehensive plan (referred to as the general plan in California) is particularly important in setting the overall direction and framework for developing and implementing other types of plans.

A variety of planning tools can be used by local governments to implement conservation priorities, including zoning and development regulations, capital investment, and programs. Examples of zoning and regulatory tools commonly used to preserve lands with conservation value in rural areas include conservation subdivisions, conservation zoning or overlay districts, and transfer of development rights. Tools such as low impact development standards, landscape ordinances, and site design standards can be used to promote conservation in more developed areas. For example, open space dedication and landscape requirements/incentives can promote preservation/restoration of remnant natural habitat areas and use of native species.

Examples of capital investment tools include purchase of land or development rights (the strategies deemed most effective by the planners consulted in 2016), environmental restoration projects, and tree planting/greening projects. Conservation goals can also be incorporated into traditional capital projects undertaken by local governments—for example, "green streets" that are designed with green stormwater infrastructure. Examples of programmatic tools include forest conservation, volunteer tree planting and environmental restoration, technical assistance, and educational programs. Engagement of volunteers is an effective way to build a constituency for landscape-scale conservation.

Conclusion

Achieving the long-term SECAS vision of lands and waters that sustain fish, wildlife, and plant populations while improving citizens' quality of life will require: 1) reducing the impacts of new development on natural resources and 2) extending conservation activities into existing urban areas. The paradigm of green infrastructure as a network of natural resources that provides ecosystem services and benefits across contexts (rural, suburban, and urban) and scales (site, neighborhood, city, regional, and beyond) is a powerful conceptual approach that can promote collaboration of urban planners and conservation professionals to address these two major needs. APA's work on the South Atlantic Conservation Blueprint demonstrates how planning activities and tools can achieve conservation goals and cobenefits for communities. There are many successful examples of this approach within the region—for example, the Tallahassee-Leon County Greenways Program; Atlanta's Green Infrastructure Strategic Action Plan; the Lake Ogletree Conservation Overlay District in Auburn, Alabama; and tree protection ordinances in places such as Charlotte and Chapel Hill, North Carolina. Public education and engagement regarding the benefits green infrastructure provides for people is essential to build a constituency for landscape-scale conservation.

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Figure 1. Emerging megaregions (Federal Highway Administration and Georgia Tech Center for Quality Growth and Regional Development n.d.).

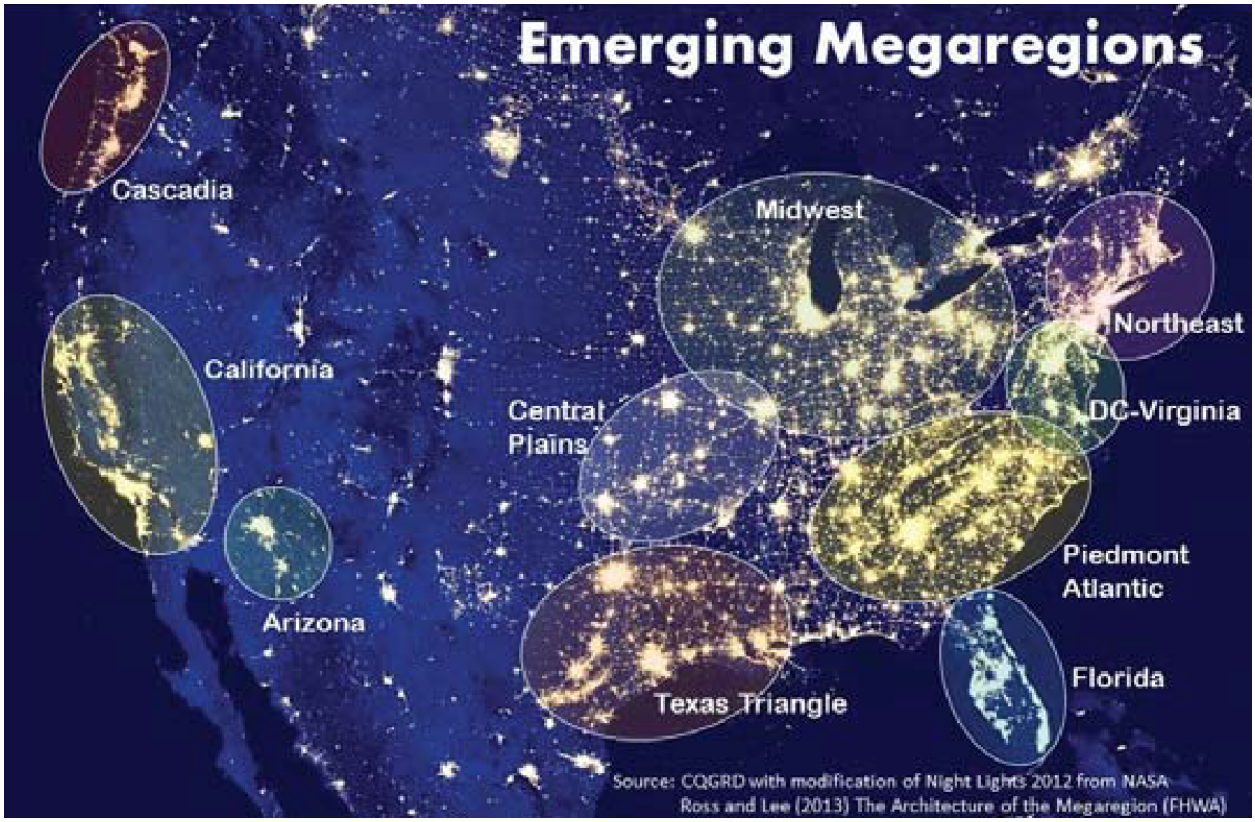

Figure 2. Green Infrastructure Cobenefits (Rouse and Bunster-Ossa 2013).

Green infrastructure can…	
absorb stormwater, reducing runoff and associated impacts such as flooding and erosion.	…to benefit the **environment**
improve environmental quality by removing harmful pollutants from the air and water.	
moderate the local climate and lessens the urban heat island effect, contributing to energy conservation.	
preserve and restore natural ecosystems and provide habitats for native fauna and flora.	
mitigate climate change by reducing fossil fuel emissions from vehicles, lessening energy consumption by buildings, and sequestering and storing carbon.	
create job and business opportunities in fields such as landscape management, recreation, and tourism.	…to benefit the **economy**
stimulate retail sales and other economic activity in local business districts (Wolf 1998, 1999).	
increase property values (Neelay 1988; Economy League of Greater Philadelphia et. al. 2011).	
attract visitors, residents, and businesses to a community (Campos Inc. 2009).	
reduce energy, healthcare, and gray infrastructure costs, making more funds available for other purposes (Heisler 1986; Simpson and McPherson 1996; Economy League of Greater Philadelphia et. al. 2011).	
promote healthy lifestyles by providing outdoor recreation opportunities and enabling people to walk or bike as part of their daily routines.	…to benefit the **community**
improve environmental conditions (e.g., air and water quality) and their effects on public health.	
promote environmental justice, equity, and access for underserved populations.	
provide places for people to socialize and build community spirit.	
improve the aesthetic quality of urban and suburban development.	
provide opportunities for public art and expression of cultural values.	
connect people to nature. Studies have shown that better health outcomes, improved educational performance, and reduced violence can be among the resulting benefits (Ulrich 1984; Kaplan 1995; Berman, Jonides, and Kaplan 2008; Kuo and Sullivan 2001a, 2001b).	
yield locally produced resources (food, fiber, and water).	

Figure 3. South Atlantic Conservation Blueprint.

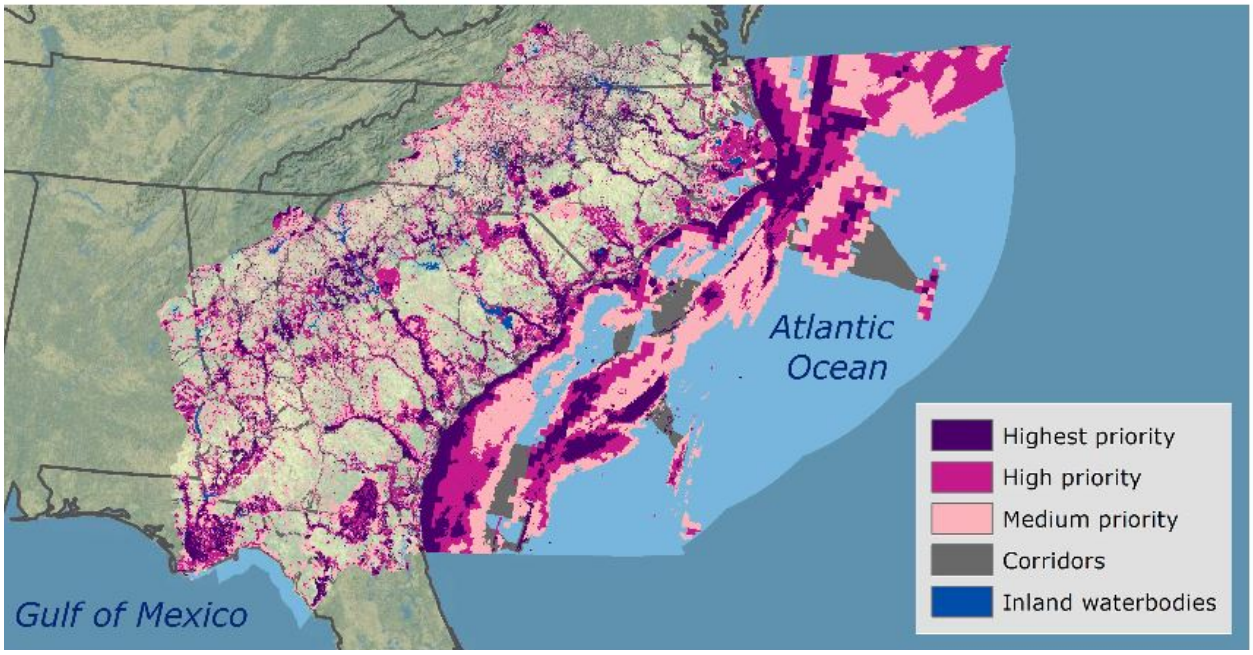

Table 1. Conservation Challenges Identified by Conservationists and Planners

Challenges Identified by Conservationists	**Challenges Identified by Planners**
1. Coordination • Unclear conservation objectives • Lack of regional links • Uncoordinated planning 2. Education • Time/ability to engage stakeholders • Developer/landowner education • Political appetite for conservation	1. High growth/development pressures 2. Private property rights 3. Availability of funding 4. General awareness/understanding 5. Political will 6. Lack of capacity in small/rural communities

Table 2. Effective Strategies to Limit or Mitigate Development

Strategies Identified by Conservationists	**Strategies Identified by Planners**
1. Zoning 2. Tax incentives 3. Quality development • High density • Good connectivity • Conservation design 4. Multiuse conservation areas 5. Showing the economic value of conservation	1. Land acquisition 2. Conservation easements 3. Public education • To support zoning restrictions • To support taxes that fund conservation • To support conservation spending • Marketing/branding an area

Scaling SECAS: Engagement is Key

David Whitehurst
Virginia Department of Game and Inland Fisheries
Henrico, Virginia

Jean Brennan
U.S. Fish & Wildlife Service
Shepherdstown, West Virginia

This is the last of a series of talks focusing on the Southeast Conservation Adaptation Strategy (SECAS), a state-led effort across the southeastern U.S. to guide a regional conservation approach and help fish and wildlife species and habitats adapt to future conditions. This approach was initiated in recognition of competing demands by an expanding human footprint and associated habitat losses and changes and promotes the dialogue necessary to plan, prioritize, and implement conservation actions at multiple scales. It represents a unique model for collaborative conservation that combined input from multiple landscape partnerships to examine future trends and prioritize natural systems to conserve based on their ecological and conservation values and connectivity at a regional-scale. The SECAS Blueprint (Blueprint) is not just a map. It is a framework to present the conservation-valued areas as a way of rallying support and partnership, but more so, to frame the critical job of prioritizing and planning across jurisdictional boundaries and land ownership; the missions and mandates of land and natural resource management agencies (i.e., those working with state and federal fish and game organizations and federal or military installations); and land stewards (i.e., those working with parks and land trusts). This strategy should assist in recruiting a broader suite of partners necessary to strategically identify focal areas, to complete conservation design for these areas, and to implement appropriate conservation actions. Successful adaptation of the conservation challenges of this century will require the engagement of new—and some unfamiliar—partners. This strategic Blueprint or framework should greatly assist potential partners in recognizing the critical roles for their participation in this regional landscape—be they lands held to generate economic growth, recreation properties, or military installations—to sustain our fish, wildlife, and natural resources and systems into this century. This paper focuses on this last element—engagement—as a critical element to fully realize the potential and successfully scale the SECAS approach across multiple scales.

Looking forward, we see that SECAS provides an excellent model to address the large-scale regional challenges of the 21st century. The first benchmark in our transformation to a new conservation approach dates to the release of the first State Wildlife Action Plans (SWAPs) in 2005. An integration of these 56 plans by the United States produced a national measure of the scale of the challenge—viewed in terms of the staggering number of more than 12,000 species already in sharp decline. These species of greatest conservation need quickly led to the stark realization that addressing that scale of threats without adopting a dramatically different approach would not reverse this large-scale species decline. Obviously, the collective actions of the conservation community were not adequately addressing the needs and were not going to work, given the ever-expanding challenges of increased development, expanding human population demands on land and natural resources, and observed trends in climatic changes. SECAS provides a second benchmark: to frame our conservation action and implementation approach going forward. But, as the prelude implies, if we are to address this challenge nationally we must expand—to scale-up the model—to build the necessary national support to sustain this way of working. This paper makes an initial effort to consider scaling-up the SECAS model as our third benchmark in transitioning to a more effective, relevant, and ultimately successful North American conservation approach. Specifically, the paper will: (1) look at the history and guidance leading up to this point in our conservation journey toward a *regional* approach to conservation; (2) consider the need to take the regional SECAS Blueprint down to the *state* or *local* level; and then (3) raise the focus to scaling the collaborative model up to a *national* level. The main thesis of my remarks is that our profession—fish and wildlife—is transitioning

from a business model of natural resource management to one of collaborative landscape conservation to achieve our missions and mandates.

A Look at History and Guidance Leading Us to this Regional Perspective in Our Conservation Journey

The use of the term "business model" is central to this paper as it serves to remind our professional membership that we are a business. Some people in this profession may feel that this term is inappropriate given the "higher calling" and "working towards the benefit of the greater good" that many of us feel; however, ours is a profession of service. But as a business, we survive or fail based on: 1) the value-added services and products we provide (to society as our client); 2) our competitiveness in a rapidly changing environment (i.e., changing social values and competing demands for social services like transportation, military readiness, access to medical care, etc.); and 3) how we choose to position ourselves within this external environment if our business is to meet future needs (i.e., how we allocate capital and human resources and plan our work to be strategic or continue on our more opportunistic path). The call to reconsider our business model is not new. Earlier authors and speakers challenged us to rethink our business model on two fronts: our target and how we articulate and explain our business to both our external and internal audience.

The first reference is that of Charles (Charlie) Baxter in his "Open Letter to the Directorate" in 2006. Charlie shared his observations with his U.S. Fish & Wildlife Service (USFWS) leadership that the conservation path we are on (primarily, as a natural resource-focused model of harvest and yield) would never be able to address the conservation of nongame species in decline. More of our conservation charge would be heading toward listing under the endangered species framework—and acknowledging our inability to keep pace with it now, let alone hope to meet an escalating need in the future. The only hope was to get ahead of the need—to shift to a proactive-versus-reactive approach instead of chasing behind in an ever-expanding wake of species decline and loss. The "target," as noted, needed to change—to focus on protecting, restoring, and connecting "landscapes capable of sustaining priority species range-wide" (Baxter 2006). That is, conservation should be treated "fundamentally as a multiscale endeavor—to reconcile site-scale actions with landscape-scale processes and functions"—and needed to move "from the opportunistic to the strategic" (Baxter 2006). Our agencies need to plan and work at a landscape-level based on the best predictive knowledge of changes in land-use, human population growth, and impacts of changing climate conditions. Charlie's letter greatly influenced Sam Hamilton's thinking as he became USFWS director and played a significant role in the adoption of the strategic habitat conservation approach and creation of the Landscape Conservation Cooperatives (LCCs).

The second reference is to Jim Martin, formerly with the Oregon Department of Fish and Wildlife, who spoke at this same conference in 2006 in Columbus, Ohio. He called upon our profession to change our messaging—to "reposition" how fish and wildlife management appears in the public perception (i.e., how we articulate our business model "in ways that will resonate" with a society that does recognize and value environmental and watershed protection) (Martin 2006). "We need to have the credibility and public support to influence land-use decisions in favor of wildlife resources—but usually through the lens of ecosystem viability, services, etc." (Martin 2006). People understand how these value-added services impact their lives and quality of life now, as well as that of their families' in the future.

A Scale-Down to the State/Local Level from Regional Information Displayed in the Blueprint

SECAS is a great state-supported initiative, and the Blueprint offers a valuable framework to initiate planning and decision-making discussions, as the earlier speakers in this session have addressed, and help others make large, regional investments. But scaling down regional maps to the state or local level requires much more; it requires a finer look into the underlying data or modeling approach to define connectivity. This section examines some of the factors that states may wish to consider when it comes to

scaling down the SECAS Blueprint. The first is how areas were identified as conservation priority sites and how those align across state, regional, and jurisdictional boundaries.

Aligning LCC-Defined Geography and Targeting Cross-State or Cross-Jurisdictional Collaboration

Overcoming the first hurdle of aligning differing scientific approaches in one geospatial representation has been demonstrated through the SECAS effort in creating the one regional map across six LCCs. In the case of the state of Virginia, three major areas are recognized: 1) the western area, part of the Appalachian LCC with its mountain habitats and biodiverse aquatic rivers and stream; 2) the central and coastal marine shores to the East, focal regions of the North Atlantic LCC; and 3) the southern Piedmont region, which is part of the South Atlantic LCC. Each LCC pursued independent landscape conservation design approaches, but many of the underlying data sets captured similar environmental metrics. The unifying aspect of utilizing the SECAS Blueprint is that it allows this sort of blending between differing scientific approaches. Conservation design created by the Appalachian LCC and the SECAS Blueprint clearly identified the conservation importance of the Tennessee River Basin (TRB).

To illustrate the finer factors, the Appalachian LCC, in its efforts to scale down to earth, completed finer-scale modeling for the TRB. The resulting landscape conservation design is referred to as NatureScape. The next hurdle at the state level is using the SECAS framework to engage other state, federal, and conservation partners. In our example, the TRB spans parts of five states and almost all of Tennessee. Virginia represents a little less than one-third of our geography but is home to almost half of our threatened or endangered species (47.2%), many of which are endemic. This finer-scale and partner-prioritized modeling output map represents similar information: local, rich conservation areas joined by connectors to facilitate species movement and habitat migration over time, given future modeling predictions on expanding urbanization, energy development, change in hydrology and precipitation under future climate conditions, and watershed scores based on human development index. The value of these future geospatial designs is that it allows us to follow, as Baxter (2006) has pointed out, the need to get ahead of expanding changes and work across jurisdictional boundaries with a suite of state and federal partners to secure, today, the habitats and connectors we will need for tomorrow.

Engage Land-Use Decision-Makers and Nontraditional Corporate Partners

Using the TRB to illustrate a state agency perspective, we can draw up the lessons already learned through our previous LCC partnerships. The geographical design for a landscape-based conservation focal area must have an ecological basis, and key partners must have meaningful input in developing the geographical footprint. This is especially true for state fish and wildlife agencies and our leadership; to understand what is happening within smaller subregions, the partnership chooses to focus its planning and conservation delivery upon prioritized and potentially most effective management actions. This also allows the conservation partners to identify key sectors and actors to strategically engage. In the TRB example, we work closely with representatives of the energy sector, through the Tennessee Valley Authority (TVA), that share the mission of delivering healthy watersheds. From the TVA perspective, that ensures their mission to deliver reliable hydroelectrical power. From the fish and wildlife agency perspective, that ensures the riparian and freshwater ecosystems that sustain countless numbers of endemic and imperiled aquatic species. It also allows our researchers to apply more detailed data sets to future modeling and impact assessments, as a reduction in area increases the chances of having common data sets across the entire modeled geography (i.e., modeling must have end-to-end data layers to ensure an unbiased projection). But although this level of detailed explanation may serve to engage our research and management audience, our more sustained conservation efforts rely on our ability to engage local communities, land-use planners, and decision-makers.

Support or Help Build Local Conservation Networks and Build Sustainable Local Support

Engaging this broader audience in communicating our business model message is critical. The TRB is an excellent case study of how we see the expanded role of state wildlife agencies going forward: to communicate the value-added services and products our work delivers to the broader society. But most

importantly, we have also learned that our ability to spread that critical messaging can only be possible by tapping into existing, or helping to codify, conservation networks. The scope of the work exceeds the staffing and resources available to any state or regional conservation entity. We must work through and support local networks and partners. In the case of the TRB, we are also fortunate to be able to engage local environmental education and recreational institutions like the Tennessee Aquarium to help spread the news of both the need and the opportunities for local engagement and support towards local conservation that contribute to a broader regional impact. We relied on the research conducted by the University of Maryland to create a report card for the region. It served not only as a tool for managers to prioritize on-the-ground actions but also provided a general and easily understandable outreach tool to engage networks, watershed groups, local communities, etc., to join our conservation effort.

Scale-Up SECAS to Raise the Focus of Adopting a Collaborative Model Up at a National Level

SECAS has provided a promising model for regional conservation, but given the scale of the challenge, we need to work towards achieving our third benchmark—a national framework. The Southeast Association of Fish and Wildlife Agencies have rallied around the SECAS model, as have the Northeast Association of Fish and Wildlife Agencies, in the development of its Regional Conservation Needs program that supported research and design—Nature's Network. In the West, the Western Governors Association and the Western Association of Fish and Wildlife Agencies have supported the Critical Habitat Assessment Tool that also presents a regional conservation design. The Midwest Association of Fish and Wildlife Agencies has demonstrated a single-species regional (as part of an international) conservation initiative in leading the monarch conservation strategy. We as a nation are well poised to reach our final benchmark if we work together, across regions, to create a seamless design, a network of regional conservation partnerships, supported by local networks and communities.

The challenge has been recognized. Our regional associations have demonstrated their ability to organize and plan at this larger regional scale. We now need to rally support of a broader coalition, as has been presented as the results of a 2016 Blue Ribbon Panel on Sustaining America's Diverse Fish and Wildlife Resources, an independent body made up of industry and business leaders, researchers, a sportsmen's group, resource agency directors, environmental lawyers, and nonprofit conservation groups. Their charge was to consider our challenge: how to sustain America's diverse fish and wildlife resources. Not surprisingly, this business savvy group concluded: first, invest proactively rather than reactively and "examine the impact of societal changes on the relevancy of fish and wildlife conservation and make recommendations on how programs and agencies can transform to engage and serve broader constituencies" (Blue Ribbon Panel 2016). And second, the panel stressed the need for dedicated funding at a national level; the Alliance for America's Fish & Wildlife has taken up the charge to promote this effort. SECAS plays an important role in demonstrating to national leaders and Congress that this vision is well within our grasp.

Essential Elements to Frame Our Engagement at All Scales

Our charge—to engage—is the sustaining force that flows between all levels, at all scales. It is the factor that determines the success or failure of our new business model. As Baxter (2006) noted: "One of the principal tenets of management theory [is] many businesses fail or decline because the assumptions that underlie their decisions (about society, markets, customers, products, technology, and mission) are made obsolete, invalid, or irrelevant by a constantly changing business environment." To review what we have learned from almost a decade of work through the LCC partnership, we offer a few essential elements to advance this new conservation model by engaging old and new partners in this important work.

Essential elements for successful, national implementation of this business model include:

- solid corporate vision of the need;

- clearly defined and accepted geography;
- well established governance structure that recognizes and respects mission and jurisdiction of partners;
- a broader coalition including nesting of taxonomic partnerships (such as the bird joint ventures or fish habitat partnerships, TRB network, etc.) within the geography, if possible; and
- landscape-level focus on science delivery, conservation design, assessment, and adaptive management; and partners that implement according to mandates and missions.

We have a great opportunity before us. The opportunity to come together to jointly define our new path, our new business model. But there is no time to waste. The fish and wildlife profession is in a period of significant change. Thousands of species are in serious decline. Factors associated with that decline have been identified: habitat loss and fragmentation, invasive species, population growth and associated development, and climate change. These impacts are occurring on an ecological scale. Baxter and Martin clearly stated the need to change to a landscape-based business model, and we have collectively taken steps to move to such a model. Others are working to secure the funding necessary to reverse the decline of the nation's wildlife, and this coalition can also play a pivotal role in increasing participation in landscape scale conservation efforts.

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Special Session Three.
The Chicken or the Egg: Broader Support or Broader Significance

Session Introduction

Karl Malcolm
USDA Forest Service
Albuquerque, New Mexico

Tovar Cerulli
Clearwater Communications
Montpelier, Vermont

What diverse values do our nation's citizens hold regarding wildlife and nature? What benefits do people enjoy due to the existence and management of robust natural systems? How can we, as natural resources professionals and public servants, better connect with broader segments of the public through their values and through the perceived and unperceived benefits they receive as products of our work? These questions, which lie at the heart of every discussion of the societal relevance of conservation, have powerful implications both for people's sense of connection with the natural world and for the political and fiscal support available to deliver conservation in the future.

There is growing consensus among fish and wildlife professionals that the some-users-pay model supporting many agencies, organizations, and conservation programs faces, at best, uncertain long-term sustainability. Hunting- and angling-based funding streams stagnate and dwindle while management challenges become more expensive, varied, and complex. Yet, participation in and revenues generated through outdoor recreation as a whole are at all-time highs. And increasingly influential coalitions of diverse user groups are uniting around shared interests in public lands and environmental stewardship. Emphasizing common values—shared by individuals and organizations that appreciate functioning ecosystems, fish and wildlife habitat, clean water, clean air, and public access—these coalitions illustrate that the dichotomy between so-called consumptive and nonconsumptive users is an unnecessarily limiting idea.

This special session will tap into the experiences and expertise of agency, nonprofit, and other thought leaders at the forefront of soliciting involvement, input, and support from broad and diverse segments of the public around widely varied conservation work. Through their insights, and with active audience participation, this session will explore several fundamental questions, including:

1) How can diverse public values—and diverse publics—be more proactively sought and honored in the management of public trust resources?
2) How can conservation leaders harness—and be an integral, engaged part of—relevant social trends to advance their conservation mission?
3) How can conservation professionals and partners identify pockets of opportunity for fostering impactful coalitions around shared values?
4) What progressive opportunities exist in a changing cultural landscape for traditional user groups to promote broader social relevance and a broader base of support for conservation while maintaining vital leadership roles?

The Changing Face of Conservation: A Closer Look at Funding & Relevancy for the Future

Sara Parker Pauley
Missouri Department of Conservation
Jefferson City, Missouri

What an honor to be asked to be part of this special session, among some amazing experts and speakers, to put our brains together and focus on this big picture question—how do we gain broader support *and* broader engagement for the conservation work we do? If it were a magic bullet answer, I would have the golden, billion-dollar ticket, but the answers, unfortunately, are complex and multitiered. But I do believe there are some common themes that should direct our sails to the future and give us hope, or even a lighted path, for tackling these big conservation questions and challenges.

But first—a story. A while back, I was reading this story where a gentleman shared about a game he used to play as a kid called "Bigger and Better" and that his teenage kids have now taken up playing. In this game, everybody starts with something of little value, like a dime, and then everybody heads out into the neighborhood to see what they can trade it for. You knock on people's doors and ask if they'd be willing to trade something for a dime, and then to the next door with whatever they traded you. The goal is to come back with a bigger, better thing than what you started out with. The bigger it is, the better.

He shared how his son Richard started with a dime one day and went to the neighbor's house and said, "Hi, we're playing Bigger and Better. I've got a dime, and I'm hoping to trade for something better. Do you have something you can trade me?" The guy at the door had never heard of the game, but he immediately shouted over his shoulder to his wife, "Hey, Marge, there's a kid here and we're playing Bigger and Better. What do we have that's bigger and better than a dime?" Richard walked away with a mattress. And on he went to the next house. He went from a mattress to a ping-pong table, from a ping-pong table to an elk head, and then several more trades later…to an old Dodge pickup truck. That's right! He started with a dime and drove home in a pickup truck. Are you thinking what I'm thinking? Best game ever!

The gentleman makes the point, after sharing this story, that there are things in our lives, and especially our work, that we want to hang onto for dear life because it's comfortable in our pocket like our beloved shiny dime. But what if we were willing to trade up? To let go of something, to dream bigger and better. To bravely knock on the doors of people or partners who don't know us and say: "We need you!"

From my perspective, here are a few areas were need to dream bigger and better.

Funding

Let's start with the dime and talk about funding. Exactly 80 years ago, the state of Missouri began its conservation story in a very dark place. In the early 1930s, the natural resources of the state were decimated—forests were burned; wildlife was almost nonexistent (thanks to market hunting!); rivers were full of gravel instead of fish; and politics, not science, ruled the decisions and funding of the state fish and wildlife agency. But sportsmen and women came together and dreamed bigger. It was a *bold* idea! They wanted to create a conservation commission, established by citizens with their voice and their vote, which would be independent of politics, with a focus on science, long-term research, species restoration, outdoor recreation, protecting our natural resources, and strong outreach. Their long-term vision turned Missouri into a place with thriving wildlife, abundant forests, and healthy fish around the state. But like Richard in the story, they didn't sit still. They realized that now that they had a solid foundation, there was something that would make long-term success even more of a possibility—dedicated conservation funding. In the 1970s, voters came back to the table and leaned in for conservation once again to pass a dedicated one-eighth of 1% sales tax for the department. This funding, separate from permit sales, would ensure the success of long-term scientific research studies, dedicated dollars for nongame species, the building of nature centers for outreach and education, conservation programming for the public,

conservation education in schools, and the list goes on. They called it the Design for Conservation, which intentionally made conservation relevant to *all* Missourians and created a comprehensive plan and a forward-thinking vision of how everyone would benefit from the passage of this dedicated sales tax. People could not only see how it impacted them directly, they also understood that it would not be possible without them.

This funding has allowed Missouri to think more broadly about audiences we need to reach with the conservation message. It has also allowed us to create one of the first human dimensions teams in the country to keep a pulse on citizens' needs and wants for conservation. It has allowed us to expand our conservation education programs and public information. It has allowed us to have more frequent conversations with citizens and partners. It is a constant reminder that we are stewards of sustaining public will because we are citizen led, citizen driven, and citizen funded. All their voices are important. Their significant contribution has allowed us to do so much for conservation in Missouri because of those consistent and dedicated funds. But funding is not the only part of the equation.

The "We" Principle

I really love the part in the story of Bigger and Better where the neighbor turns to his wife and shares what Richard is asking, but then says, "We are playing Bigger and Better." We. I think "we" might be the most powerful pronoun we have. We are all in this together. But what does that look like in a changing world? As the world changes at lightning speed, are we changing, too? Are we keeping up?

In Missouri, we have a two-part mission statement—to protect and conserve the fish, forest, and wildlife resources of the state *and* to provide opportunities for all citizens to use, enjoy, and learn about these resources. Both are equally important. When we talk about people getting outside to discover nature, are we offering the programs and opportunities that they want? Are we staying relevant to how younger generations want to experience nature? I heard this great presentation recently on the state of youth culture where the speaker shared some valuable insights about younger generations. They are all about experiences versus accomplishments, including wanting to have a résumé of amazing experiences. They are not just one personality; they are a combination of athletes and academics and everything in between. They want new adventures and will rarely do the same thing every weekend. They are strong activists and truly want the world to be a better place, and they are going to come up with the ideas, and do the work, to get us there.

So taking that information—how do we create new experiences for them? How do we combine their strong desire to be activists and have them join us as citizen scientists? How do we offer programs that combine adventure, activities, and education—all in outdoor experiences close to them? And, maybe the bigger question, what programming do we need to trade up, let go of, get rid of, in order to make space for these unique experiences? There is so much potential and impact here to connect and be relevant.

Thinking Outside the Box

Trading a mattress for a ping-pong table, then a ping-pong table for an elk head—it's a unique way to look at the world, to be completely open to thinking bigger and outside the box when the door opens. We have some opportunities to also think outside the box, including with creative partnerships and more diverse audiences.

One of the creative partnerships happening right now in Missouri is in the urban core of St. Louis. We have a partnership between us, Green City Coalition Project, City of St. Louis, the Mayor's Office, St. Louis Sewer District, the Missouri Botanical Gardens, and other conservation partners, where we are trying to think creatively about inner city green space. There are 62 square miles of inner city St. Louis where houses have been run down and abandoned over the years, and as those houses are torn down because they are uninhabitable, these partners are working together to make that a viable and productive green space with native plants to help our pollinators. It is also a tremendous help to people, including

their physical and emotional health, to have trees, native plants, and green space in the neighborhoods where they walk and drive by every day. This unique partnership has worked on 80 properties so far with an ambitious 1,000 more on the horizon. This is an incredible example of how powerful partnerships can be to conservation and to local communities.

In addition, we also have 100 libraries all across the state where people can check out free fishing poles and tackle boxes to go fishing, just like they would check out a book. We have partnerships with landowners where they have opened up their property to anglers, wildlife watchers, and hunters, while also improving wildlife habitat on their property. We have students learning archery in school to increase their focus, test scores, and self-esteem, including becoming national and international archery champions last year. In fact, in less than 10 years, Missouri National Archery in the Schools Program has skyrocketed, with more than 700 schools and 180,000 kids now participating. And we have chefs in urban areas teaching sold-out crowds how to make delicious recipes from wild game and other foraged edibles. We have also redesigned our flagship magazine *Missouri Conservationist* based on focus groups and survey feedback to keep the content and design fresh, as well as to continue to appeal to a diverse audience. We are doing Facebook Live on almost every big event or unique research project to show in real time how amazing conservation is.

While we've got some great successes under our belt and some in progress, we've also missed the mark on a few things. For example, we had this incredible partner meeting last November to gather input from more than 125 partners on a shared future vision for conservation in Missouri. Ideas were flowing. But one young attendee came up to me during the meeting and asked: "How come I'm the only young person at this meeting?" It was an aha-moment, and she was exactly right. We'd extended gracious invitations and were listening intently, but most of those leaders were of similar age and diversity. We are not relevant if people cannot see themselves in the conservation picture. Humbling, isn't it?

At the end of the Bigger and Better story, Richard drove home with a truck, but there was more to the story. He didn't keep it. He then drove it down the street to a local church and gave them the keys, so they could give it to a family in need. He gave away the bigger and better to someone who needed bigger and better even more.

Here's what I want to leave you with today. People need our bigger and better more than ever. They are stressed and overscheduled, bombarded with messages and checklists, running ragged and chronically exhausted. We have something that can help with all of that. Nature. Fresh air. Outdoor time. Free adventures. As Henry David Thoreau said, "We need the tonic of wildness. We can never have enough of nature." People need nature so desperately, *but*, just like we mentioned in the Design for Conservation, they need to be able to clearly see how they fit into the conservation picture. We can't love what we don't know. We won't support what we can't see ourselves a part of. It is as simple, and yet complicated, as that.

So, in closing, keep knocking on those doors. Keep sharing the conservation story. Keep being inclusive. Keep asking for their ideas. Keep exploring creative partnerships. Keep seeking sustainable, long-term funding. And, most importantly, keep evolving and changing, despite the growing pains it can cause, and never ever stop trying to be bigger and better.

"We'd Rather Have Them Pick Up a Rod and a Reel Than a Gun and a Clip": The Fishermen of the Harlem Meer

Taimur Ahmad
The Wilderness Society
Washington, District of Columbia

The Story

Mel whipped his rod back with a flourish as I hurried to get out of the way. Turning towards me, he grinned: "I don't do no wild casts." The lure soared across the lake and landed with a splash. As the ripples subsided, Mel began to jiggle and hop the imitation minnow back to shore. The evening light reflected off the steel and glass of the apartment towers surrounding the lake and lit up the water, making the fishing line glow. Children shrieked and laughed in a playground nearby, a man with a boom box attached to his bicycle blasted music as he pedaled past, and a siren went off from north of 110th Street. But Mel stayed entranced, insulated from the noise of New York City by the deep stands of trees and the green lawns that form a bowl around the lake known as the Harlem Meer.

Located in the northeastern corner of Central Park, the Meer is 11 acres of green, shallow water regularly stocked with bass, sunfish, crappie, and several other species of gamefish that attract anglers from all over the city. Egrets, turtles, and raccoons all make their homes along the lakefront, and the Meer is one of few places in the city where you can count on seeing a great blue heron stalking through the shallows. A path surrounding the water makes for an easy stroll. Though ringed by apartment towers and busy streets, the Meer retains the feel of a place apart, separated from the intensity of the surrounding city.

Mel is a Meer regular and one of the core members of a community-based organization called The Fishermen that operates from its banks. He and his fellow members teach local kids how to fish—providing gear, technical instruction, and lessons in the Meer's ecology. Nat, a Vietnam veteran, 9/11 first responder, and founder of the group, describes the organization as a grassroots program. "We get no funding. We get nothing. Being impoverished people from broken homes and what not, what we do is we try to establish this mentorship program."

The program is built around Nat's "General Orders," a code of values and conduct printed out and distributed to the participants. The goal is to "keep the kids in a positive state of mind" by making sure they are engaged in a healthy activity like fishing in the park instead of idling in their apartments or getting into trouble on the street—a service the community appreciates. Mel takes pride in the fact that families like their kids to stay around us in the park. As he puts it: "They don't want their kids getting into problems. We'd rather have them pick up a rod and a reel than a gun and a clip."

The Fishermen are made up of middle-aged to older African-American men who mostly live in nearby public housing. They are at the Meer nearly every day, all day, weather and season permitting. Aside from participation in the mentorship program, The Fishermen are often unemployed. Some have previously been incarcerated, and others have struggled with homelessness.

As a native New Yorker with a love for the outdoors, I grew up fishing in the Meer and hanging out with the characters who would congregate there. But it wasn't until I returned to the park to conduct ethnographic research as a sociology student in college that I began to really dive into the stories of guys like Nat and Mel. Gregarious, quick to laugh, and with a wide smile, wearing his signature white polo shirt, Mel is the sort of guy who sets the tone for whatever scene he is in. He will give you his favorite Senko without a second thought and show you exactly the hole to sink it into and just how slowly to bring it back in. Nat, in contrast, takes on the role of the elder. He drills the kids on hook safety, respect for their parents, and taking care of the Meer ecosystem but will always take a sunfish off the hook for a child too squeamish to do it themself. Though he can be a stern mentor at times, Nat's occasionally silly sense of humor still shines through as he heckles his fellow Meer regulars, from kids to cops.

After spending a whole summer fishing together, one afternoon in late August, I sat with Nat and Mel on "the bench," swapping lures and talking about the park. "We sit on this one bench," Nat explains to me, "and the people know us from sitting on this *one spot*." The bench serves as their office space. From it, The Fishermen accept rod and tackle donations, supervise the kids, and communicate with the police and parks enforcement officers assigned to the area. They also socialize with each other. Country, another member of the group who got his nickname on account of his down-south accent, swings by the bench and sits down. For Country, being a part of The Fishermen and socializing on the bench at the Meer "gave me a sense of family because I have no family in New York."

"[It is a] tight-knit community that fishes this lake," Country says. "Everybody knows each other. These are the people you see every day. White, African, Mexican, it don't matter." The Meer community helped him get through his mother's recent passing by providing a supportive group of people for him to talk with.

For Country, the Meer also provides something of a sanctuary. "Outside the park, I be miserable because I don't have nothing to do. I can't work [due to a disability], I don't drink. If it weren't for this, I'd have nothing to do and I'd be stressed out. But I can just walk here every day."

And even Mel, despite his cheerfulness, thinks he'd "probably be locked up or somewhere in the drunk tank" without the Meer. "This pond saved me. I can come here and relax and not worry about nothing."

The Fishermen community also led Mel to a construction job when he needed work. Perhaps even more important for Mel, however, is that "all the little kids know my name. I could go anywhere [in this neighborhood] and all the kids will know my name. Everyone respects us when they see us—'Oh, there go The Fishermen!'" This goodwill extends from local parents and their children to the mostly white police who patrol the Meer. They have a noticeable rapport with The Fishermen, characterized by inside jokes and gear donations. Nat is confident that the park uplifts the community. "We walk down the block and the parents say, 'Thank you for keeping my son away from the building.'"

Spending time with the fishing community at the Meer makes it easy to understand these feelings. Instead of being stuck in their apartments or on their blocks with nothing to do, the Meer supports the development of men like Mel, Nat, and Country from under- or unemployed locals to public figures who become respected mentors in the park. The organization is unregistered, unfunded, and informal, yet The Fishermen form an institution that provides valuable services to nearby families and, even more so, to the men of the organization themselves, who derive a very real sense of self-worth from what they do for their neighbors and for local kids. The Meer gives The Fishermen a safe, green sanctuary away from the stresses of both work and home that allows them to form long-lasting and meaningful social networks with other regulars. Because of these networks, the Meer becomes a place that offers Nat and Mel more than just largemouth bass and a good time. Mel knows when he needs it, the other Fishermen can come through with opportunities for jobs and housing, as well as emotional support in tough times.

As the day comes to a close, the lamps above the bench light up. The convivial atmosphere The Fishermen enjoy runs on into the night as they chat and joke. Occasionally, one of them even catches a fish. Mel jumps up to help a young girl who is wandering a bit too close to the water's edge while Nat shows me grainy cell phone photos of the monster crappie his son caught in the Meer last year. "It's a big feeling," Nat tells me, reflecting on his years of fishing with local children. "When you see their eyes open up like fifty-cent pieces when they catch their first fish, that's what really gets 'em. They're hooked for life."

Significance for the North American

What are the reasons you go out onto public lands? This was one of the main questions I asked the audience at my presentation on The Fishermen at the 2018 conference. The answers were familiar:

- Recharge or get away from the stresses of everyday life
- Stay healthy

- Have fun
- Spend time with friends
- Mentor and educate new hunters and anglers
- Build and/or engage with the local community
- Connect with nature

As the conversation around the need for "relevance" continues year after year at the North American, I find it striking how much conference attendees have in common with The Fishermen of the Harlem Meer when they discuss their reasons for engaging with the outdoors. While it would be naïve to assume these two communities are fundamentally the same—and counterproductive to ignore the obvious differences between them—the shared values the two groups hold around outdoor recreation, angling, and public lands indicate to me that the conversations being held at the North American may be far more relevant to a broader segment of the American population than many attendees realize.

As a child, whenever we got a large snowstorm, I would grab my backpack, fill it up with pots, pans, and books and head out to a big rock slab a few minutes walk away in Central Park. I would scrabble up it with my loaded backpack, pretending to be a mountaineer and having an amazing time doing so. As a kid growing up in New York City, Central Park was my public land. It was where I went to have adventures in the woods, where I went with friends or to find solitude, where I found communities that mentored me, and where I learned to fish. It never occurred to me that I wasn't in a national park or on federal land—or that I was in a city. The formative experiences I had with nature in the park were the same as any child might have anywhere.

If the story of The Fishermen has any lessons for attendees of the North American, it is these two: firstly, we need to redefine how we understand public lands and their users to be far broader and more inclusive of a wider segment of Americans; and secondly, that while differences between communities of public land users may be significant, there is a core of shared values around being outside that spans the country—from the backcountry hunter in Wyoming to the urban fisherman at the Harlem Meer—and which is crucial to tap into as the North American community strives for relevance.

These observations do not lend themselves to easy solutions. Relevancy is not as simple as going to the Harlem Meer and signing up the locals as members in their regional chapter of Trout Unlimited, even if that is a worthwhile long-term goal. But understanding that urban landscapes are sites where hunting and angling communities can flourish and that men like Nat are not only constituents but also leaders within those communities is a first step. As we as professionals in this field go about our day-to-day work, I simply urge us to consider the locations and populations we may have more in common with than we think and find community-based, respectful ways to engage them.

Carrying out such engagement can be difficult, and detailing how to do it is another topic entirely. Still, here's a place to start: find your own local Harlem Meer, whatever that means to you. Take your rod and go fish. See who's there, and when it feels right, say hi.

Building Community-Focused Relationships as the Foundation for Diversity, Equity & Inclusion in the Outdoors

Leandra Taylor
Middle Rio Grande Merge Community Alliance
Albuquerque, New Mexico

In my experience, there are four main components to building meaningful and lasting relationships and, ultimately, partnerships. Like any relationship, courting and continued efforts are key determining factors of the relationship's success. Recognizing that the conservation movement has been historically exclusive (resulting in a majority white outdoor community) will help organizations understand some of the barriers faced by many marginalized communities.

Messaging and Communication

Messaging and communication can be the life or death of any relationship, especially a collaborative. It's important to understand the values and priorities of potential audiences or partner organizations. When communicating the desire to work with new groups, pay attention to your word choice when setting intentions.

For example, consider: "What can we do for each other?" versus "What do you need? How can we help you?" or some other way of saying, "We're doing this great thing for you." Because the relationship should be mutually beneficial, there should be no one-sided communications.

Another example would be: "public lands" versus "outdoors." The term "public" can be exclusive as it can be interpreted as a question of one's citizenship.

Time & Face

When pursuing new relationships or partnerships, investing time in lunches, meetings, community gatherings, etc., creates a positive rapport and trust between both parties.

Trust & Consent

It is important to acknowledge that the conservation movement was founded on racist ethics and colonial objectives. Many communities of color continue to struggle with their relationship with the outdoors and conservation movement, both of which are privileged interests.

When engaging with new audiences and communities, especially those you do not belong to, it is important to prioritize trust and consent. Trust and consent may come in the form of asking consent to host events on native lands, building relationships with trusted community leaders, and, most importantly, meeting people where they are, as opposed to asking them to come to you.

Pace

Pace is as important in a partnership or collaborative relationship as it is in any other relationship. Both parties must feel comforted each step of the way to ensure no miscommunications occur.

Adapting Conservation: Speaking to Human Potential

Juan Lazo Bautista
USDA Forest Service
Washington, District of Columbia

Remember the last time you were in awe? Earthy smells of wet soil and repeated tapping of rain on my bare head clamor in my memory. These memories and the desire to experience nature again and again drive the work that I do and represent a growing culture among a broader group of Americans enjoying the outdoors and nature.

As a resource assistant for the USDA Forest Service working in the office of conservation education, I am tasked with making the natural environment, particularly public lands, accessible to diverse audiences, many of whom are immigrants and/or millennials. Within these demarcations lie a wide range of experiences and understandings of nature, presenting the unique opportunity to create intentional spaces where land management agencies and organizations can engage the public in meaningful ways that speak to personal interests and experiences, empowering them to explore and protect our natural areas on their own terms.

I, for one, am an example of this trend. Born in a weavers' town in rural Oaxaca, Mexico, my parents heavily relied on the natural environment to sustain their craft and support a growing family. Their looms, made by local wood craftsmen, brought together the colorful dyes for wool collected from the valley region we lived in. For generations, our craft had been perfected, added to, and innovated to ensure a balanced relationship with the natural world and the sustainability of our livelihoods. However, with time and the added complexities of governance, this balance was disrupted. The demand for our textiles had waned—a byproduct of global competition and a deteriorating value for artisanal products.

Realizing the lack of opportunities, our family traveled across international lines to California, seeking what we knew best—working the land. My father picked fruits and vegetables for American dining tables, cultivated plants and flowers in a nursery, and trimmed and pruned elegant gardens—a true outdoorsman. And while his life had always involved working outside, his relationship with the land had changed. Long gone were his escapades to the river while cattle herding or slingshot hunting small game. He was on foreign land, with new rules and expectations. The future he and my mother dreamed and worked toward now lay far beyond the land that had brought them there.

Fast-forward 18 years later, and their American dream has become a reality. My sisters and I are, for all intents and purposes, American, with university degrees and salary jobs. And yet, "American" means many different things now. For one, being part of the millennial generation implies breaking molds and a free flowing imagination. That, coupled with being the most diverse generation and soon to be the largest in history, paves an inevitable path towards change.

We therefore have a tremendous opportunity before us to capture the imagination and enthusiasm of a widely diverse group of Americans. The future of conservation and the enjoyment of the outdoors lie in speaking to these human values and the potential of individuals to be stewards of our natural spaces and resources in their own, unique way. Just as my parents' values and lived experiences have shaped my own, the same heterogeneity is abundant for many others with interconnections amongst their families, friends, and social networks. Redefining conservation to fit the infinite creativity of an entire generation requires an open-ended invitation to engage the public in its own capacity and encouraging shared knowledge as an eager listener. There is no greater feeling of validation than an open forum to express yourself freely. That's the unimagined dream that my parents worked for and which so many of us now seek to capitalize on as we work to preserve our natural endowments. Asking more and allowing for a free reign of creativity means giving the public a choice in how they want to protect and experience nature, that which brings them back again and again.

New Voices for Shared Values: Elevating Our Impact and Relevance Through Bridge Building

Land Tawney
Backcountry Hunters & Anglers
Missoula, Montana

This past summer, I got the opportunity to go on a trip of a lifetime, put together to celebrate my daughter's 9th birthday: her first backpacking trip into the storied Frank Church Wilderness in central Idaho. It was hot—too hot. The first mile of the hike had been easy going along Marsh Creek. The excitement was heavy and the promise of hungry cutthroat trout motivating. But the next mile got steeper. As happens with a group, our plans to stop for lunch in "another 15 minutes" turned into 20, then 30. Finally, we found a respite next to the creek, and I got Cid to dunk her head in the cool, clean water. Tears commenced, along with pleas to head home. My young daughter had hit her limit.

If you've spent any time in the woods or on the water, you know that feeling, that conviction that it can't get any worse and you don't see it getting any better. It doesn't matter if you hunt, fish, kayak, mountain climb, or mountain bike—you know that feeling and how hard it is to overcome.

Grit. That's the word that best describes that moment when it's all up to you, no one else, to carry you forward. The mountain, stream, and cliff don't care who you are. They give handouts to no one. There are no shortcuts, no one to do it for you. When the chips are down, you have to dig deep inside and find that spirit to carry you through. Grit is one of the enduring qualities that only public lands and waters can create—the great equalizer.

Cid's face gradually changed from bright red to a softer shade of pink. Her breath had returned to normal, and she had added some much-needed fuel to her tank. I decided to tell her a story about Theodore Roosevelt, an often-discussed icon in our household. Roosevelt grew up with debilitating asthma. Instead of succumbing to the affliction, he worked hard to overcome it. He climbed peaks, boxed, and lived the strenuous life. He, and no one else, made the choice to overcome something that could have easily hampered his lifestyle. He showed grit. After finishing the story, I let the words linger and left Cid by herself to contemplate. When I came back minutes later, she was ready to roll.

Cid crushed it on the remaining mile of the trail—a mile that was even steeper than the last. She beat many of the adults who were with us and raised her arms in triumphant joy when she reached our alpine lake destination. Her exuberance for the trip returned, and she promptly jumped into the icy waters and, for effect, ate a black stonefly nymph. While my story about T.R. may have motivated her, she did it herself. She had learned a life lesson, and I couldn't be more proud.

All Americans own 640 million acres of public land ranging from U.S. Forest Service and U.S. Fish & Wildlife Service (USFWS) to Bureau of Land Management and National Park Service lands. It doesn't matter if you are a Wall Street executive from New York City; a schoolteacher from Missoula, Montana; a doctor from Albuquerque, New Mexico; or a mechanic from Norfolk, Virginia, we all own it. It's our birthright. Public lands are the great equalizer and a place where birth or financial status doesn't matter. Public lands provide places to hunt, fish, mountain bike, trail run, kayak, pick huckleberries, and so on. And even if you don't ever set foot on any of our public lands, they are essential to clean air and clear water. Seventy percent of our streams start on public land. Finally, public lands are the cornerstone of the $887 billion annual contribution to our economy and 7.2 million jobs. This is something that is not only sustainable but something we can grow. None of this, though, happened by accident.

In the late 1800s, we were wiping big game off the face of our continent to put steaks on tables in New York City, Chicago, and San Francisco. Bird populations were being decimated to put feathers in women's hats. Hunters stepped up and helped pass the first game laws and made the commercial sale of wildlife illegal. At the same time, a hunter, Theodore Roosevelt, ascended to the White House and set into motion our public lands legacy, setting aside 240 million acres of public land for you and me. Out of bad times came some good.

In the dirty '30s, the lid was literally coming off the prairie. Dust storms lasted days and choked out the nation. Wildlife was in trouble. Firearm manufacturers and hunters got together and dedicated

excise taxes on guns and ammunition to help pay for fish and wildlife management. Ding Darling penned the duck stamp to help pay for wildlife management and protect vital habitat through refuges. Ducks Unlimited and the National Wildlife Federation were formed. The precursor to the U.S. Fish & Wildlife Service—Biological Services—was formed. The first North American Wildlife and Natural Resources Conference was held. Out of bad times came some good.

In the 1960s, rivers were literally on fire. Rachel Carson writes *Silent Spring*. The environmental movement is born. In response, we pass the Clean Air and Clean Water acts. The Wilderness Act and Land and Water Conservation Fund (LWCF) are signed into law. All with bipartisan support. Out of bad times came some good.

None of these lasting victories happened by accident, and we won't carry forward our legacy by accident either.

Today, pressures on our fish and wildlife populations are taking a different form. The Clean Water Act is being rolled back, sage grouse conservation plans are being thrown out, the Migratory Bird Treaty Act is being amended, the largest roll back of public land protection ever took place this past year, and special places like the Arctic National Wildlife Refuge and Boundary Waters Canoe Area Wilderness are threatened. These are our dark times.

Out of our bad times, what will be our good? While hunters and anglers have been at the heart of conservation for more than 120 years, new entities are emerging. During the past few years, mountain bikers, kayakers, trail runners, and backcountry skiers and hikers have become more organized and are engaging in conservation. While hunting and fishing numbers continue to decline, birders continue to increase. While we may not all agree on everything 100% of the time—heck, we as hunters don't even do that—I'd say we agree 95% of the time. America was built on grit and our public lands embody that.

Hopefully, the newfound synergy, based on grit, will help us fully fund and permanently reauthorize the LWCF. There have been many conversations about a "backpack tax" similar to the Sports Fish and Wildlife Restoration Fund. I hope that this is some of the good. If everyone who used binoculars bought a duck stamp, we would more than double the resources available to the USFWS. Outdoor companies played an essential role in pulling the Outdoor Retailer show out of Utah due to the ongoing shenanigans surrounding public lands by Utah elected officials. Action matters.

Some in the hunting community may be nervous about diluting their influence when it comes to the management of our public lands and wildlife. I say this is shortsighted and we must embrace diverse user groups into conservation. If we don't embrace and work collaboratively, we will all lose. There is nothing more American than our public lands and waters, and together, we will pass on our conservation legacy to future generations. Stay gritty.

Advancing Conservation and Outdoor Recreation in Colorado

Bob Broscheid
Colorado Parks & Wildlife
Denver, Colorado

Lauren Truitt
Colorado Parks & Wildlife
Denver, Colorado

Anthony L. Gurzick
Colorado Parks & Wildlife
Denver, Colorado

Introduction

Wildlife agencies throughout the United States are focused on protecting, conserving, managing, and caring for our most valued and valuable resources. The public has entrusted wildlife agencies with incredible missions. Wildlife resources form the very fabric of our states and often define us, not just professionally, but personally as well. Our agencies' foundations have been built on a strong and enduring legacy, steeped in heritage and tradition.

For more than a century, hunters and anglers have supported fish and wildlife agencies; they have been the lifeblood of conservation, of wildlife and fisheries management. Sportsmen and women were the original conservationists. Their investment and their demand for conservation brought many wildlife populations back from the brink of extinction. Many species, game and nongame both, have benefited from hunting and fishing license dollars. Hunters and anglers ensure the long-term conservation of habitat, protection of riparian corridors and wetlands, and the viability of landscapes.

Hunters and anglers have provided a sturdy conservation foundation for the United States and have helped shape a conservation and land ethic that resounds through the generations. We cannot forget the past from which we have come. Rather, we need to build upon that strong foundation; we need to be willing to adapt for the future.

The Challenges Around Us

Colorado has one of the fastest growing populations in the country, especially in the Denver metro area. The growth in human population leads to increased use of our lands and open spaces. Changes in land use cause wildlife species to lose habitat while Colorado's agricultural lands are dried up and converted to other uses. The available land for wildlife and outdoor recreation is ever shrinking.

Similar growth and subsequent land use changes are not unique to Colorado. Fish and wildlife agencies face the same dilemmas everywhere. Urbanization, agricultural conversion, increased outdoor recreation, human-wildlife conflicts, and a digitally connected population slipping further from the outdoors are just a few of the hundreds of issues wildlife managers and land managers try to mitigate and minimize every day.

Looking to the future, it is vital that Colorado's abundant and diverse wildlife populations, stunning landscapes, and world-class outdoor recreational opportunities remain for future generations. But how do we manage for the future when the world changes faster than we can keep pace? How do we get in front of the change and help direct that change, even if only incrementally, for the benefit of both the resource and the public? How do we advance and balance both outdoor recreation and conservation? How can recreation and conservation work together to help ensure the long-term viability of our natural resources?

The answer is simple: Fish and wildlife agencies must embrace a diverse conservation and recreation community. If we don't, we will be left behind; we will cease to be relevant. To build up the foundation of conservation and to build up the ranks of hunters, anglers, and outdoor recreationists, people must be offered a variety of ways to interact with wildlife and experience the outdoors. People must be offered multiple access points into our programs. For many years, Colorado Parks & Wildlife (CPW) has tried to fit people into our mold, to place people into our model of outdoor recreation, and to try and recruit them as hunters and anglers. Our models are too linear, however. We need to provide people with multiple opportunities to build outdoor skills and we need to lead them to the center of conservation. We need to accompany them on their journey, not our journey.

People do not access information or interact with other people and organizations in the ways they used to. They view experiences and lifestyles in a broader way. People do not identify themselves with a single type of outdoor recreational hobby but, instead, with many. A generation ago, a person may have self-identified as a hunter or an angler. Today, a person may identify themselves as a hunter and a mountain biker and a skier and a bird watcher. We must think creatively and holistically to engage a diverse population. The public is changing. Are we?

Partnerships

The key to working with diverse people and diverse outdoor recreationists is through fostering strong partnerships. Partnerships allow us to connect with new people; to listen to new ideas, thoughts, and concerns; and to seek innovative solutions. In Colorado, we realized it was time to reimagine and reframe our path. In 2012, two agencies—Colorado Division of Wildlife and Colorado State Parks—merged into Colorado Parks & Wildlife. We have the opportunity to educate general recreationists on habitat conservation and wildlife. We have the opportunity to form new partnerships and develop new conservations. Together, as Colorado Parks & Wildlife, we can take advantage of a broad public base and we can engage in new conversations with new people.

Educational Opportunities

CPW has found new opportunities to educate people about conservation, hunting, fishing, and outdoor recreation. We partner with sportsmen organizations; land and water conservation groups; rock climbing, mountain biking, and bird watching organizations; with educators and youth groups. We want to expose as many people as we can to the work we do and the opportunities our agency provides. The Schools and Outdoor Learning Environments (SOLE) program works with fourth-grade classes to connect families to the outdoors. Students participate in three outdoor related field trips that augment existing curriculum, and families participate together and with their community in family nature nights.

The Outdoor Wilderness Lab (OWL) for sixth-grade students gives them the opportunity to spend a week in the field. Students participate in a variety of interdisciplinary field experiences including ecology, wildlife management, history, astronomy, agriculture, and outdoor recreation. Students also have the opportunity to take a hunter-education course and receive their hunter-education card.

Outdoor expos are large-scale outdoor recreation festivals. The public is introduced to hunting, fishing, shooting, paddle sports, biking, climbing, and other outdoor activities. The expos are designed for the person with whom we have yet to interact. The expo introduces CPW and our conservation and recreation mission to new people and their families.

Collaboration

As the primary agency in Colorado focused on protecting and caring for our most valued resources, CPW has been entrusted with an incredible mission by the people of Colorado: to perpetuate the state's wildlife, manage our state parks, and inspire the next generation of stewards. We need more people educating others about the importance of conservation and stewardship of our resources.

In Colorado, we continue exploring how we can create more access points for people to interact with our agency and support our mission. One success story is through the Partners in the Outdoors Conference. This annual conference has grown tremendously since its inception some five years ago; we now have approximately 500 participants and well over 100 organizations participating in this conference. The conference has become the signature platform in the state for the outdoor industry and conservation organizations to network, collaborate, and create lasting partnerships. The Partners in the Outdoors program brings together diverse outdoor interests to make a collective impact on promoting responsible outdoor recreation, stewardship, and leadership throughout Colorado. It fosters a strong conservation ethic, creating diverse partnerships that ensure awareness and respect for natural resources, sustainable growth of businesses, and a future for the outdoors that works for all Coloradans.

The Colorado Outdoor Partnership (CO-OP) brings together leaders from across the state representing more than 35 organizations invested in conservation, recreation, and protecting Colorado's natural resources. This coalition has helped to create unity among the outdoor community and serves as the starting point for many discussions on how we connect more people to the natural resources around them. These leaders are willing to have tough discussions on conservation, outdoor recreation, and funding models. They are the outdoor leaders who can have a long-term impact on Colorado's wildlife and wild places.

We may not always agree on specific issues, but we all agree on the importance of wildlife conservation. Even though many of our efforts are just starting, we are able to unite diverse stakeholders around common goals. There is a lot of promise for a collective and collaborative future in Colorado.

Colorado's Outdoor Principles

Colorado was the first state to adopt the Principles for Advancing Outdoor Recreation and Conservation, often referred to as the SHIFT Principles, an acronym for Shaping How we Invest For Tomorrow. Complemented by our use of the North American Model of Wildlife Management, the adoption of the Colorado Outdoor Principles signifies a key addition to our agency's conservation model that affects our overall mission and defines how we work with our partners. We are focused on an outdoor ethic that promotes both inclusive recreational enjoyment and thoughtful conservation.

In Colorado, we made a few tweaks and customized the original six SHIFT principles to work for our state, most notably adding a seventh principle recognizing the role of private lands in conservation. Specifically, the Colorado Outdoor Principles state:

1. Outdoor recreation and conservation require that a diversity of lands and waters be publicly owned, available for public access, and cared for properly.
2. Within Colorado's diversity of land and waters, private land plays a critical role in preserving the ecological integrity of a functional landscape that is necessary for robust and meaningful outdoor recreational experiences.
3. Both recreation and conservation are needed to sustain Colorado's quality of life. Both are beneficial to local economic well-being, for personal health and for sustaining Colorado's natural resources.
4. All recreation has impact. Coloradans have an obligation to minimize these impacts across the places they recreate and the larger landscape through ethical outdoor behavior.
5. Proactive management solutions, combined with public education, are necessary to care for land, water, and wildlife and to provide the protections needed to maintain quality recreation opportunities.
6. Physical, biological, and social science must inform the management of outdoor recreation.
7. Stable, long-term, and diverse funding sources are essential to protect the environment and support outdoor recreation.

These principles act as a new ethical framework that allow all outdoor recreationists to better understand their role in conservation. The Colorado Outdoor Principles expand on the North American Model to include all outdoor recreationists. These principles are a tool to unite multiple diverse recreation groups and advance common priorities for the common good.

According to a recent report by the Bureau of Economic Analysis, the outdoor recreation industry contributes 2% of the domestic GDP—or $887 billion—in consumer spending annually. This surpasses the extractive industries, the pharmaceutical industry, and computer and electronic products. Outdoor recreation's impact on the United States' economy results in 7.6 million American jobs.

The outdoor industry is an economic powerhouse. As fish and wildlife agencies, we are part of that engine and we need to learn to tap into its potential. Hunters and anglers need to work collaboratively with general outdoor recreationists. Likewise, outdoor recreationists need to work closely with hunters and anglers. Together, our voices can be heard.

Are We Ready to Challenge the Status Quo?

Leaders like Roosevelt, Muir, Pinchot, and Leopold looked around and realized the things they loved were being lost; they decided to do something. They were willing to challenge the status quo. Are we? By expanding our conversation and inviting a broader and more diverse group to the table, Colorado is starting to see successes:

- The outdoor recreation community talks positively about hunting and angling in conversations they are having.
- More people are talking about conservation in Colorado and that conversation includes the role of hunting and fishing.
- Our hunters and anglers look across the table and are extending their hands to incorporate general recreation in the conversation about how we work together to protect wildlife, to protect habitat, and how we educate the public about the importance of conservation.
- In reality, many of our hunters and anglers are also our mountain bikers, hikers, marathon runners, and climbers. They are birders and botanists and we need them all.
- All of our partners are promoting the importance of stewardship of public and private lands and waters with emphasis on habitat and wildlife conservation as well as outdoor recreation.
- A broad coalition of people are supporting, improving, and strengthening public and private funding to conserve these shared priorities.

CPW takes pride in knowing that we are carrying on the legacy of conservation visionaries who came before us. It is time for all fish and wildlife agencies, as well as state park agencies, NGOs, and the outdoor industry, to pick up the torch and carry our agencies, our publics, our customers, and the resources that define our organizations into the future. The challenge for each of us is to reach out to nontraditional partners, to seek diversity in all of its forms and in all of its locations. Form new partnerships, build bridges, and join people on their outdoor journeys. We must all embrace the diversity of opinions and interests. It won't be easy; it will challenge our traditions. But, in the end, hunters and anglers will remain relevant and wildlife will continue to thrive. It is time to build off of our great legacy to create our future.

The Call to Clarify Identity: How State Wildlife Agencies Can Win Hearts and Minds Across America

Ezra Milchman
Metropolitan Group
Portland, Oregon

In recent years, state wildlife agency leaders have engaged in a dialogue about how to ensure the relevance of their institutions—and of fish and wildlife conservation, more broadly—in a rapidly changing world. They may find a path forward by examining how other similarly challenged sectors have successfully addressed related core questions.

Clarifying Higher Purpose and Value is Key

Fifteen years ago, the library sector faced a set of interrelated problems. Not only were libraries losing funding, it also appeared they were becoming irrelevant. People thought about libraries the way they thought about their half-forgotten great-aunt, the one everybody loves but nobody visits. Research conducted by Metropolitan Group (MG)—including talking and listening to people around the country—confirmed that libraries were, in fact, becoming less and less relevant. People did not care much about having access to large book repositories, which is how libraries were still positioning themselves. But libraries did matter deeply to people for other reasons. What excited people was that libraries are places where their kids can be safe, do homework, and figure out their futures. What excited people was that libraries offer career and job search resources. With these insights in hand, libraries began to think differently about what they have to offer. They began to develop a new vision for the purposes they serve in a changing world.

A few years later, the land trust community came to MG. For decades, land trusts had focused on maximizing bucks and acres—donations made and land area conserved. This had drawn the scrutiny of members of the U.S. Senate Finance Committee who suspected that land trusts were giving excessive tax breaks to the rich for protecting—and limiting public access to—their own backyards, which they never intended to develop anyway. Spurred by potential abolishment of conservation tax incentives, the land trust community realized it needed to reassess its purpose. Talking and listening to people around the country, MG learned that no one cared about bucks and acres. What people cared about was protecting the places they loved, from city parks to wilderness areas. This insight provided land trusts with a whole new way of thinking about their work and why people valued it.

More recently, the arts and culture sector was struggling for funding and relevance. Rarely seen as a top priority, arts organizations, theaters, and museums were typically the first to be cut from budgets. Their leaders wanted to understand what was going on and how to fix it. What these institutions touted was their great collections of artwork, performances, and other cultural commodities. But MG's research—conducted across ethnically, geographically, and socioeconomically diverse groups of people—revealed that people cared about these organizations for a completely different reason: connection. Arts and culture organizations provide people with places to connect with themselves, their families, and their communities. This was transformational not only for the sector's narrative but for its programming. With this new understanding, arts and culture organizations began thinking about how to serve the purpose of connection more intentionally and effectively.

Across these different causes and sectors, figuring out what the country needed and was calling for—and using this insight to clarify and redefine higher purpose and value—was the first step toward greater relevance. Greater relevance, in turn, enabled each of these sectors to fulfill its mission more effectively by leveraging greater engagement, increased support, enhanced funding, and favorable policies.

Purpose is central to every organization's identity. What is the higher purpose of state fish and wildlife agencies today? What is it about conservation that people most value in a changing world?

Across diverse communities, why do people care? As agency leaders continue to deepen the dialogue about relevance and search for ways to engage broader constituencies, answering these questions is a crucial first step.

Knowing and Communicating Values Draws People to Your Higher Purpose

Step two is connecting to and articulating values. Any effort to define or redefine purpose must be anchored to the values that drive your mission. These values become the basis for connecting with others who share your higher purpose. With clarity about the values for which you stand, you can seek out those who share your values and want to be associated with your cause. Consider for a moment the values that so effectively drive contemporary social movements, generating energy and momentum.

This country's gun-rights movement is strong and the value driving it is clear. As the National Rifle Association frames the message, "It's not just about guns, it's about freedom." Freedom to be safe. Freedom to bear arms. Freedom is a powerful core value in our culture, one we all hold dear in some form, whether or not we identify as part of the gun-rights movement.

For decades, the marriage-equality movement in this country focused on talking about "marriage as a right." Using that message, the Human Rights Campaign, a national leader of LGBTQ causes, failed to gain traction. Beyond its core group of supporters, people resisted the idea of special rights. It was only when the movement shifted its focus to core values of love and family—to messages like "love is love" and "the power of family"—that it began to gain widespread support.

In 2006, Tarana Burke, a social activist and community organizer, began using the phrase "Me Too" to talk about sexual harassment and assault against women. But it wasn't until 2017—when the focus shifted to core values of dignity and respect, and when celebrities called for mass tweeting to expose the magnitude of the problem—that the hashtag #MeToo went viral and the movement suddenly gained momentum.

Values are a second key element of identity. What values do state wildlife agencies stand for today? How do these values connect to the kinds of core values—like freedom, love, family, dignity, and respect—that tap this country's deep reservoirs of energy and fuel today's most vibrant social movements? If agency leaders have difficulty seeing such connections, they may be missing an opportunity for increased relevance.

Voicing a Values-Based Narrative Draws People to Your Cause

Clarity about your higher purpose and core values becomes the foundation for a winning story that communicates the priority and urgency of your work and inspires people to think in a whole new way about joining you. Consider two effective narratives that have ushered in change that some never believed possible:

> Make America Great Again is a powerful story about the way things used to be. This narrative has attracted and inspired many people, offering hope to those who feel a sense of loss, who perceive that "family values" are under attack, and who want greater emphasis on tradition and national identity.
>
> The Dreamers narrative is a powerful story about children, hard work, and hope for the future. Rooted in this narrative, Deferred Action for Childhood Arrivals (DACA) has gained strong bipartisan support, presenting an opportunity for polarized ends of the political spectrum to discover shared values and beliefs related to the American Dream.

Communication is a third vital component of identity. How can clarity about the higher purpose and values of fish and wildlife conservation translate into a winning narrative for today and tomorrow? How can the story extend beyond fish and wildlife conservation alone and create a bigger tent of support for your work? With this story written, how can a communication strategy bring it to market in ways that activate more diverse stakeholders in service to your cause?

The Three Vs of Identity

The three questions outlined above go to the heart of all causes, movements, and organizations: What *value* do we offer the world? What *values* do we stand for? What *voice* do we speak with?

These three questions—which we at MG refer to as "the 3Vs"—are fundamental to the identity of state wildlife agencies today.

- What *value* do state wildlife agencies provide or need to provide? What is their higher purpose in this changing world? Why do people care?
- What central *values* drive or should drive state wildlife agencies? How do these connect to our country's deepest values?
- What *voice* do state wildlife agencies use or need to use? How can purpose and values be woven into a powerful narrative that generates widespread support and engages all priority constituencies?

In the context of the complex challenges faced by state wildlife agencies today—including tightening budgets, strained funding models, and increasing responsibilities—very few have been able to step back and answer these core questions. Yet asking and answering these questions is key to ensuring the relevance of fish and wildlife conservation and to effectively engaging the American public in all its diversity.

Moving Forward

If wildlife agencies are committed to pursuing enhanced relevance, there are several foundational next steps to consider. First, deepen your understanding of why people care about conservation and clarify your agency's higher purpose. Second, clarify and articulate your agency's values and how they connect both to your higher purpose and to the kind of core shared values that inspire today's most vibrant movements. Third, build a powerful narrative that is grounded in your higher purpose and values and that resonates deeply with people.

Once these steps have been taken, state wildlife agencies will have clarified their identities in ways that facilitate and ensure relevance. Individually and collectively, they will be poised to design and implement an integrated strategy for: 1) unifying agencies and allied sectors around higher purpose and values, 2) communicating a new narrative and getting it to take hold in public discourse, and 3) articulating calls to action and activating diverse stakeholders as champions for the cause.

Special Session Four.
Fish and Wildlife Conservation in the 21st Century: How Poaching, Trafficking, and Illegal Trade are Endangering the North American Model for Wildlife Management

Perception vs. Reality: Economic Considerations Surrounding the Illegal Take of Wildlife

Rob Southwick
Southwick Associates, Inc.
Fernandina Beach, Florida

Wildlife take occurs for many legal and illegal reasons. Illegal takes can be divided into two major categories. This paper focuses on the intentional category, defined as the "intentional, illegal harvest of wildlife or fish." Within this definition, intentional illegal takings can be further divided into organized takes and crimes of opportunity. Organized takings typically happen with a profit motive, such as bear gall bladders, rhino horn, and illegal netting. Crimes of opportunity are often not preplanned but nevertheless occur intentionally. A common example is when a licensed hunter, hunting in an open season for a legal species, comes in contact with a closed species: "It's there in front of me, why not?" For the rest of this paper, the terms "illegal intentional harvests" and "poaching" will be used interchangeably.

Why Do People Poach?

Poaching is driven by economic reasons. Reasons can be financial or profit-based. But economic gain can be more than financial. Feelings of satisfaction, earning bragging rights, and similar reasons all make an individual feel better off, just like high school students who often are not motivated to earn good grades through financial payments but instead are rewarded with feelings of self-satisfaction and positive peer acknowledgment. Though a negative value socially, this type of poaching has a positive value for the poacher.

Poaching happens after an individual considers the risks and rewards of illegally taking game. Risk and reward considerations are made with nearly all decisions faced in life, whether it's the time and social costs of preparing for final exams versus good grades or the cost of spending more for Brand X, which has more features than Brand Y. Many of the major risks and rewards associated with poaching are listed in Table 1, though this list is not exhaustive.

Why Do We Care? The Social Costs

Intentional, illegal takes of fish and wildlife have multiple public and social costs, including:

1. Lost recreational opportunity—fewer chances for legally licensed hunters and anglers to enjoy the resource they help fund with their license fees and excise tax payments;
2. Lost conservation revenues—reduced funding for conservation agencies and efforts;
3. Replacement costs of resources—greater costs in some cases for agencies to replace lost fish and wildlife when illegal harvests become excessive;
4. Increased enforcement costs—diverting funds towards increased law enforcement places downstream opportunity costs on other conservation programs;
5. More stringent regulations—excessive illegal takings can then lead to shorter seasons, smaller bag limits, and larger size requirements;
6. Loss of recruitment—excessive illegal harvests and their resulting increased restrictions on legal harvests makes hunting and fishing less attractive to newcomers;

7. Lost commercial opportunities and jobs—legal commercial harvests could be reduced when populations of target species are affected by excessive illegal harvest, resulting in lower income and standards of living for participants; and
8. Loss of public support for current wildlife management efforts—excessive poaching can erode public trust in the ability of resource agencies and the sporting community to effectively manage fish and wildlife, potentially leading to a diminishment of the North American Model of Wildlife Conservation and greater nonscientific management by ballot box.

How Can Intentional, Illegal Takings Be Reduced?

Considering people poach for economic reasons, economic approaches can be used to reduce illegal harvests. The challenge is to change poachers'—or potential poachers'—perceptions. Specifically, our task is to raise their perceived costs while lowering their perceived benefits from taking wildlife illegally. There are generally three points people consider when assessing risk versus reward:

1. Apprehension—can we increase their perception or fear they will be caught?
2. Swiftness of punishment—if caught, will the punishment be administered quickly or will it occur at some nebulous point long into the future?
3. Severity of punishment—what will they have to pay, what will they lose? Interestingly, social research indicates this is less important than the swiftness of punishment.

Poaching is less likely to occur when the perceived risks outweigh the rewards. Using mass media and modern communication techniques, here are some steps the fish and wildlife community can take to increase the perceived risks while diminishing the perceived rewards in the minds of current and would-be poachers:

1. Promote efforts to catch poachers—let people know that skilled law enforcement officers are searching for poachers, usually successfully. Time is on their side.
2. Promote the fear factor—it's not just the day or evening when an illegal take occurs that poachers are caught, many poachers are apprehended days or months later, meaning the perpetrator will live in a state of fear and anxiety greater than the reward from the kill.
3. Promote the fines, loss of future hunting privileges, loss of equipment and vehicle, loss of freedom associated with being caught—let the public know the full and maximum costs one will face once convicted of poaching.
4. Does the price fit the crime? We need to make sure national, state, and local jurisdictions have adequate laws, penalties, and restitution levels on the books if we want the judicial process to hand out adequate sentences and not just administer a slap on the wrist.
5. Encourage the public to step up calls for prosecution and sentencing—the judicial process commonly will hand out minimum sentences if the public is seen as not caring.
6. Restitution values—in addition to criminal fines, make sure the public is aware that many jurisdictions require convicted poachers to pay an additional monetary value based on the replacement cost per animal illegally killed.

Summary

As long as people desire wildlife or enjoy the act of illegally taking wildlife, poaching will persist. Our job as fish and wildlife management professionals is to help minimize illegal takes to ensure the long-term health and viability of fish and wildlife populations. Keeping in mind the economic reasons why people illegally and intentionally take fish and wildlife and the factors that dissuade them from doing so will help identify the actions the fish and wildlife community can take to minimize poaching.

Table 1. Major risks and rewards associated with poaching.

Risk	**Reward**
Jail time	Profit
Criminal record	Trophy
Loss of privileges	Meat/food
Loss of vehicle/gear	Challenge/thrill
Social stigma	Social status
Fines and legal fees	

The Impacts of Intentional and Unintentional Release of Injurious Wildlife—A Florida Case Study

Thomas H. Eason
Florida Fish and Wildlife Conservation Commission
Tallahassee, Florida

Kristen Penney Sommers
Florida Fish and Wildlife Conservation Commission
Tallahassee, Florida

Andrea Wylie
Florida Fish and Wildlife Conservation Commission
Tallahassee, Florida

Sarah Funck
Florida Fish and Wildlife Conservation Commission
West Palm Beach, Florida

Introduction

Florida tends to be used as an example of what can happen when nonnative fish and wildlife are released into the wild, establish, and become invasive. Although invasive species are not a problem unique to Florida, Florida's subtropical climate has been conducive to the expansion of many nonnative species including pythons; large lizards, such as monitors and iguanas; many freshwater fish species; and more recently, lionfish. The citizens of Florida, particularly south Florida, frequently encounter these exotic species. Almost 60,000 observations of nonnative wildlife have been recorded in Florida since 1924. This represents 500 different nonnative species (FWC unpublished data). It is believed that most of these observations represent single individuals that may have been released or escaped from captivity—intentionally or not. Of the 500 species, we estimate that more than 150 have reproducing populations.

Invasive species enter the United States through a variety of pathways, including intentional and unintentional pathways. Invasive fish and wildlife establishment occurring from unintentional pathways—such as released from ballast water or other attachments to ships, natural disasters, or accidental escaped captive wildlife or aquaculture products—may be hard to predict. Intentional releases—such as those involving ranching of nonnatives for the pet trade or intentional release of unwanted pets—may by more preventable. It is widely accepted that the greatest pathway by which nonnative fish and wildlife find their way into Florida's habitats is through escape or release from the live animal trade (Krysko et al. 2016). While this pathway is not the only possible route of introduction, many species of imported pets are released or escape due in part to Florida's prominence in the exotic pet trade.

Although these actions can lead to major impacts, many of Florida's residents want to own nonnative species as pets or sell for commercial use. Reptiles, for example, are extremely popular, especially in urban areas, as they do not require large backyards and thrive in Florida's subtropical climate. In addition, the pet industry generates billions of dollars in the United States each year and includes small business owners as well as larger corporations. Exotic pet shows and expos are popular in Florida, with more events occurring here than in any other state. Many of the exotic animals sold at these shows are purchased by private individuals as personal pets (Stallins and Kelley 2013).

Regulatory Framework

Both the federal and state governments have a role in regulating nonnative fish and wildlife, and many times, these regulations complement one another. The Lacey Act is the primary regulatory tool at

the federal level to limit the introduction of nonnative fish and wildlife. Initially passed in 1900, the Lacey Act was the first federal law enacted to protect wildlife. It enforces civil and criminal penalties for the illegal trade of animals and plants. The injurious wildlife provisions of the Lacey Act, codified in Title 18 (18 U.S.C 42), provide the United States some protection from invasive fish and wildlife that are considered an economic, human health and safety, or ecological risk. Under this act, species on the Injurious Wildlife species list are considered a risk and cannot be imported into the country without a permit from the U.S. Fish & Wildlife Service (USFWS). Until recently, certain provisions of the act were also interpreted to prohibit interstate transport (importation into a state from an adjacent state) of Injurious Wildlife. In April 2017, the U. S. Court of Appeals – DC Circuit stated that the statute does *not* prohibit transport of Injurious Wildlife between states within the continental United States. Other prohibitions and regulatory measures of the act, including disallowing international importation, still apply.

Most states also have some level of regulation of nonnative fish and wildlife. These regulations vary widely between states and may include prohibition, allowances for education and research, measures to contain those in trade, or permit conditions if allowed as personal pets. It is important to note that the Injurious Wildlife species list and the individual state regulatory lists do not necessarily align. While some species are represented on both lists, others may only be regulated in a single grouping. In other words, some species listed as Injurious Wildlife at the federal level may not be regulated at the individual state level. Many species listed as Injurious Wildlife are currently not regulated or restricted at the state level because the previous federal law was considered sufficient to prevent the importation and subsequent establishment of these species.

Florida is considered to have some of the most comprehensive captive and nonnative wildlife regulations in the country. Wildlife in captivity are highly regulated and categorized by the level of human health and safety threat they may pose. Other nonnative fish and wildlife may be classified as "conditional" or "prohibited" species. These regulatory listings restrict the use of conditional species to permitted individuals for research, public educational exhibition, or commercial import or export use. Prohibited species are likewise restricted and may only be possessed for research or public education exhibition. It is unlawful to possess conditional or prohibited species as personal pets. Like many states, Florida's regulated list of nonnative species does not perfectly align with the Injurious Wildlife species list under the federal Lacey Act.

Florida Case Studies

Burmese Python

The Burmese python (*Python bivittatus*) has garnered significant public attention as an established invasive species in Florida. Burmese pythons are large constrictor snakes native to southeast Asia, specifically India and China. They are considered semiaquatic and can stay under water for up to 30 minutes. To date, the largest python found in Florida was 18-feet-8-inches long. Though this species can grow upwards of 20 feet in total length, they are extremely difficult to find in the Everglades ecosystem. As a result of their cryptic behavior and camouflaged pattern, researchers have estimated detection probability of less than 1% (Dorcas and Wilson 2013). This finding indicates that for every python we find, we have missed 99, creating a significant challenge to controlling this species (Dorcas, Pittman, and Wilson 2017). This low detection probability also makes estimating population size impractical, if not impossible. However, despite low detection probability, more than 5,000 pythons have been observed or removed from Florida and reported to the Florida Fish and Wildlife Conservation Commission (FWC) (FWC unpublished data).

Burmese pythons have been reported in extreme south Florida since 1979, with most reports from south of Lake Okeechobee to Key Largo and from western Broward County across to the Naples area (Meshaka, Loftus, and Steiner 2000; Snow et al. 2007a; FWC unpublished data). Areas where pythons have been detected tend to be along levees, roads, and canals with higher levels of human access. Burmese pythons are now considered to be firmly established in south Florida and continue to expand in distribution across geopolitical boundaries including federal, state, tribal, and private lands.

Pythons are considered invasive largely due to their impacts to Florida's ecology. Figure 1 illustrates a hypothetical diet necessary for a hatchling Burmese python to reach 13 feet in the Florida Everglades, which may take five to seven years (Mazzotti and Harvey 2015). Burmese python diet in the Everglades consists of approximately 70% mammals, 28% birds, and 2% reptiles and other items (Snow et al. 2007a; Dove et al. 2011). This broad diet poses significant potential adverse impacts to Florida's native wildlife, including some threatened and endangered species. Burmese pythons also have a high reproductive rate, laying an average of 40 eggs per successful breeding cycle; however, nests may contain more than 100 eggs (Brien et al. 2007; Harvey et al. 2008). The breeding season starts in the winter months and extends into early spring (Snow et al. 2007b). As soon as a juvenile python hatches, it can survive independently and begin feeding. High reproductive rate, lack of natural predators, and a generalist diet make the Burmese python a successful invader in Florida, potentially adversely impacting our native wildlife (Reed and Rodda 2009).

Due to their large size and reports of captive pythons injuring or killing humans, many members of the public also perceive these animals as a human health and safety threat. Although, there are no records of wild pythons severely injuring anyone in Florida, they may act defensively when cornered and will strike. Concerns over whether the fear of pythons equates to decreased recreational activity in Florida and ultimately a loss of tourism may be another potential impact, though it is currently unmeasured.

The state and federal government have taken steps to decrease the probability of future Burmese python introductions through regulatory action. In 2010, the FWC listed the Burmese python as a "conditional species," with the result that Burmese pythons are no longer allowed to be acquired as personal pets in the state. With a proper permit, Burmese pythons may still be owned for education, research, or commercial activities. These species are afforded no protections. Similarly, in 2012, the USFWS placed this species on the Lacey Act's Injurious Wildlife species list, which prohibits their importation into the country without a federal permit. With the recent changes in the interpretation of the Lacey Act, Burmese pythons, along with other injurious fish and wildlife, are now allowed to be moved across state lines. This ruling has implications for trade of this species nationwide and may impact future python control and management strategies in Florida.

Due to the complex patchwork of land ownership in south Florida, where pythons occur, interagency coordination is crucial for managing this species. Our collective focus is on preventing additional python introductions, slowing or preventing the spread of this species to new areas through detection and reporting programs, managing impacts to high-priority natural resources, and continuing research on improved detection and long-term removal methods. By working across agency lines, we share ownership of python management and research projects in Florida. Cooperation among partners allows for increased efficiency, as well as being more cost-effective. Cooperating partners coordinate python surveys and field responses to new sightings. This action facilitates a faster response to citizens who may encounter a python in the wild or in urban landscapes.

Python management continues to be challenging despite the concerted efforts of the FWC and our partners. State law allows the lethal removal of pythons year-round from private lands with landowner permission. On most state managed lands in south Florida where the species is established, citizens may lethally remove pythons and other nonnative reptiles, no license or permit needed. For years, routine surveys and removal efforts have been a strategy of many of our land management partners working to control pythons. Direct removal efforts and strategies include targeted removal of pythons by agency staff, use of contractors to remove pythons from public conservation lands, and encouraging the public to remove pythons through the use of incentive or volunteer programs.

Argentine Black and White Tegu

A more recent invader that has been of increasing concern to the FWC and our partners is the Argentine black and white tegu (*Salvator merianae*). Tegus are the largest lizards in the New World, reaching total lengths of nearly five feet (Duarte Varela and Cabrera 2000). This species is native to South America, including Brazil, Uruguay, Paraguay, and Argentina. Tegus are a fairly cold-hardy species, due to their seasonal activity patterns. In the winter months, tegus brumate in underground burrows that

protect them from extreme cold temperatures. Tegus' native range shows that they can survive as far south as 40°S latitude and, while other factors would need to be considered, a similar North American range would place the northernmost edge of the tegus' possible range in the U.S. as far north as West Virginia (Lanfri et al. 2013; Barraco 2015). Female tegus lay one clutch of 20 to 54 eggs annually and guard their nests while the eggs incubate (Donadío and Gallardo 1984).

Tegus are considered established and expanding in two areas of Florida. Known breeding populations have been established, since 2006, in Hillsborough County and, since at least 2011, in Miami-Dade County; however, the FWC has received reports of tegus elsewhere across the state. Because of their prevalence in the pet trade, many of these individual reports are likely escaped or released pets. No population estimates for the number of tegus in the wild in Florida have been completed. However, removal rates from trapping efforts and area reports indicate that the populations are spreading and increasing in number (FWC unpublished data). During the past five years, a total of more than 4,000 Argentine black and white tegus have been removed from the wild in Florida (FWC unpublished data).

Tegu diet includes plants, eggs, insects, and small animals such as lizards and rodents (Mercolli and Yanosky 1994; Kiefer and Sazima 2002; Barraco 2015). Tegus have been documented disturbing crocodile nests and consuming alligator and turtle eggs in Florida (Mazzotti et al. 2015). Tegus have also been documented utilizing burrows of gopher tortoises, a state threatened species and a candidate species for listing under the Endangered Species Act throughout its range; and FWC biologists found the remains of juvenile gopher tortoises in gut contents of tegus collected from Hillsborough County, Florida, in 2015 and 2016 (Enge 2007; Hardin 2007; Engeman et al. 2011). FWC biologists have also documented tegus interacting with gopher tortoises at burrow sites. Other species that may be impacted if tegus continue to expand include sea turtles, cape sable seaside sparrows, shorebirds, ground nesting birds, indigo snakes, and sand skinks (Homewood 1995; Bovendorp, Alvarez, and Galetti 2008; Mazzotti et al. 2015).

Trapping of tegus has been the primary focus of management efforts by the FWC and other land-managing partners. In Miami-Dade County, a coordinated tegu trapping effort with FWC and partners began in 2012, and the FWC started trapping in Hillsborough County in 2013. Innovative research is also supported to help increase the effectiveness of management efforts including techniques involving telemetry, skeletochronology, and eDNA. New efforts include partnering with private land owners by providing a trap-loan program and utilizing private contractors to increase removal rates where tegus are known to occur and to help respond to areas outside of where tegus are known to be established.

Although this species is not listed as injurious by the USFWS, the implications of expansion out of Florida or release by pet owners in other states should be noted. Tegus' omnivorous diet and ability to overwinter in burrows or under debris during cold winter months, combined with hospitable Florida habitats, appears to create ideal conditions for the species to thrive and spread. These characteristics could result in adverse impacts to the state and perhaps the nation.

Innovative Management and Research

The FWC and our partners support innovative research to increase the effectiveness of management efforts. Low detection probability for species like Burmese pythons requires the development of improved tools to increase and improve detection rates. Invasive species research is being conducted by the U.S. Geological Survey, multiple universities, and many of our other partners. Understanding the efficiency of human searches and how to increase that efficiency has been a focus of research supported by the FWC. Radio telemetry has been used to locate breeding groups of pythons and to help managers understand the movement patterns and habitat use of pythons and tegus. This information may help human searchers accurately identify areas where pythons or tegus may be present and where to look for them in those areas. Detection dogs have also been used to help human searchers find pythons. Python trap and attractant development is also ongoing, along with work using environmental DNA to determine if pythons are or have been present in an area. Python and tegu dietary analysis has been conducted to better understand the impacts that these species may have on Florida's native flora and fauna.

Outreach continues to be a focus of the FWC's nonnative species management efforts. Workshops on pythons and other invasive species facilitate partnership and coordination with other entities involved in python and tegu management at the local, state, and federal levels. No-cost online and in-person trainings are offered to members of the public who may encounter a python in the wild. These trainings, called Python Patrol, educate and empower citizens to help remove pythons from the wild and teach the public how to identify Burmese pythons, where to report python sightings, and safe capture techniques. Recently, the FWC also instituted a Nonnative Volunteer Responder Network that trains volunteers to help respond to calls received by the FWC about nonnative species.

Florida is the first state to have an established program to provide options for exotic pet owners as an alternative to release. The Exotic Pet Amnesty Program has become a cornerstone of the FWC's approach in providing assistance to people who can no longer care for or no longer desire to keep their exotic pets. People may surrender their unwanted pets to the FWC with no cost or penalties—and with assurance that these animals are made available for adoption to preapproved adopters. This program provides amnesty to people who may unlawfully have a Burmese python or other invasive species as a pet. The goal of the FWC Exotic Pet Amnesty Program is to reduce the number of nonnative species released into the wild by pet owners. Since its inception in 2006, nearly 5,000 exotic pets, including pythons and tegus, have been turned over to the FWC and have found a new, secure home.

Summary

Other Injurious Wildlife species have been recorded in Florida, such as mongoose, anacondas, and reticulated pythons. A few Injurious Wildlife species have established populations that are causing detrimental impacts in Florida, such as walking catfish (*Clarias batrachus*), bullseye snakehead (*Channa marulius*), North African python (*Python sebae*), and Burmese python. Several other nonnative species established in Florida that are not listed as injurious under the Lacey Act, such as the tegu, Nile monitor (*Varanus niloticus*), and lionfish (*Pterois volitans*), may also be of national concern. To address the potential impacts of these and other nonnative species, the FWC is continuing to emphasize prevention, early detection, rapid response, and education. Early detection and rapid response efforts include increased data collection from a statewide exotic species hotline and smartphone application called IveGot1 and using partners, staff, and volunteers to remove priority species when reported. Education and outreach continues to be a top priority for FWC. Programs like the "Don't Let It Loose!" campaign, Exotic Pet Amnesty Program, and outreach events are all part of an effort to educate the public and prevent the intentional and unintentional release of nonnative species. To address future potential introductions risks, the FWC is developing a risk assessment process and mitigation measures for nonnative species in Florida. This process will include proactive horizon scanning for potential introductions, monitoring trends in the pet trade, and species-specific mitigation strategies.

Managing invasive species is costly for multiple groups from the federal, state, and local levels. For example, tegu management costs in Florida for the FWC and seven of its partners totaled $576,317, $778,317, and $828,092 in fiscal years 2014–2015, 2015–2016, and 2016–2017, respectively. That represents a total investment of $2,182,726 across those three fiscal years. Prevention, early detection, and rapid response capabilities for potentially invasive species is the least costly investment strategy for land managers.

In conclusion, Florida (particularly, south Florida) is unique in that its climate stays relatively mild and the land is crisscrossed with canals. This makes it easy for many invasive species to not only survive but spread. These species can cause ecological, economic, and social impacts. Once a nonnative species is established, it is costly to manage and difficult to contain. Florida is using a diverse array of strategies to manage these species and to engage the public in management and prevention. Florida has both intentionally and unintentionally established species. To address the impacts that invasive species may pose, coordinated efforts of state, local, and federal partners is crucial to our collective success in preventing the establishment of potentially invasive species.

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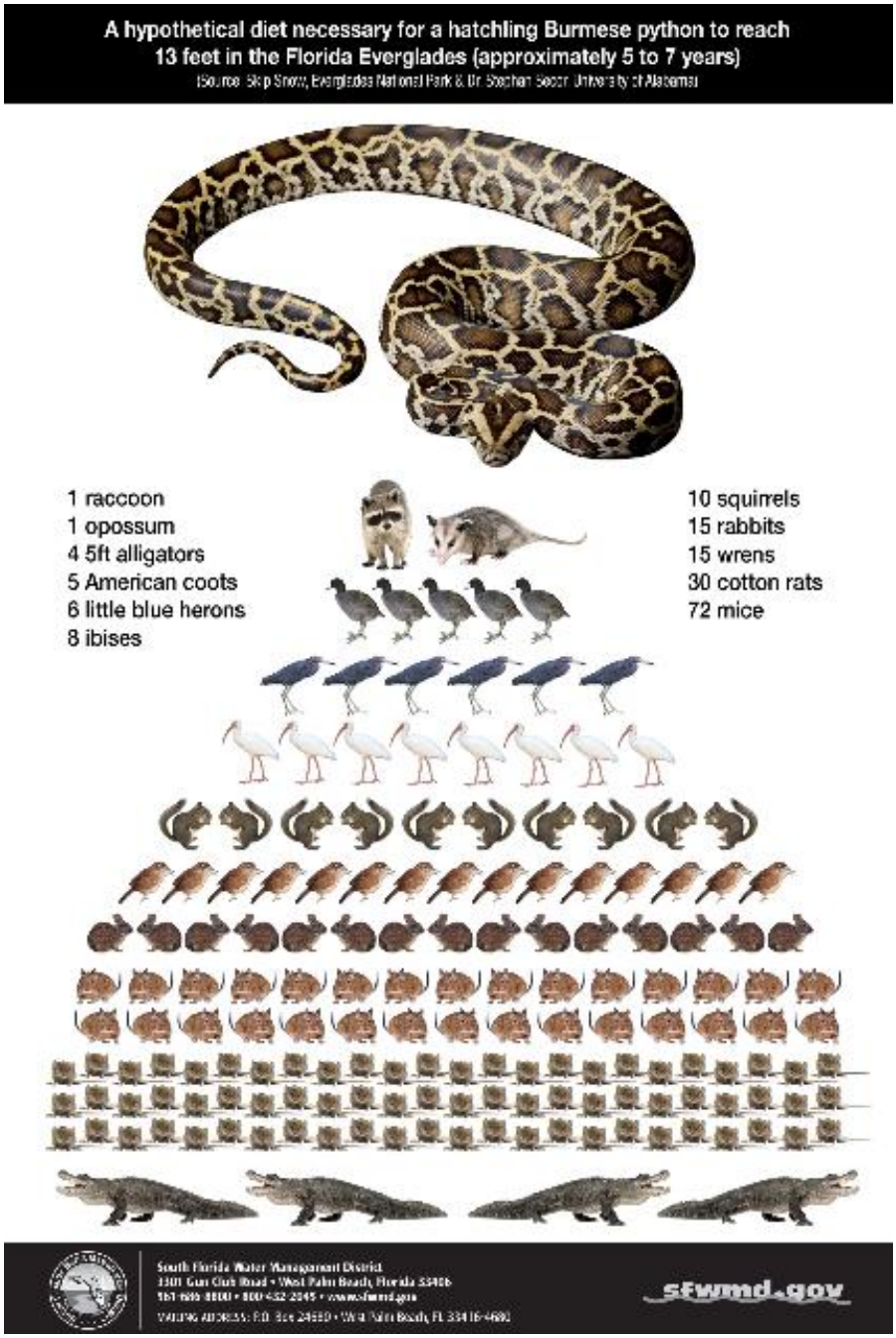
Figure 1. Hypothetical diet necessary for a hatchling Burmese python to reach 13 feet in length in the Florida Everglades (Mazzotti and Harvey 2015).



Private Ownership of Wildlife—Game Farms to Flea Markets

Louis Cornicelli
Minnesota Department of Natural Resources
St. Paul, Minnesota

Krista Larson
Minnesota Department of Natural Resources
St. Paul, Minnesota

> The nation behaves well if it treats the natural resources as assets which it must turn over to the next generation increased, and not impaired, in value.
> *– Theodore Roosevelt: Colorado Livestock Association, Aug. 29, 1910*

Background

The principals of public ownership of natural resources, began under Roman law, were incorporated into the English Magna Carta and subsequently brought to North America when the Europeans arrived and settled the Colonies (Organ and Mahoney 2007; Sax 1970). Legal precedent for the public trust doctrine (PTD) in North America was established in 1842 (Martin v. Waddell; Bean 1983). This common law (and subsequent case laws) defines public ownership of wildlife in North America and is the essential element of the North American Model of Wildlife Conservation (NAMWC; the Model). Under common law, wildlife is public property and managed in trust for current and future generations (Organ and Batcheller 2009). In brief, the Model has seven pillars (Geist, Mahoney, and Organ 2001):

1) Wildlife as a public trust resource;
2) Elimination of markets for wildlife;
3) Allocation of wildlife by law;
4) Wildlife can only be killed for a legitimate purpose;
5) Wildlife is considered an international resource;
6) Science is the proper tool for discharge of wildlife policy;
7) Democracy of hunting is maintained.

The mechanical details of the PTD and the Model have been well described by others; thus, we will not go into detail in this paper (see Geist, Mahoney, and Organ 2001; Geist and Organ 2004; Organ et al. 2012). Rather, we acknowledge our trust obligations as they apply to an array of natural resources challenges and submit that public trust thinking should be oriented in a manner that fosters long-term stewardship of our resources (Hare and Blossey 2014). For this paper, we approach the Model from two perspectives—deer behind a fence (game farms; captive cervids) and the herpetological trade (flea markets) in Minnesota. Both have implications to our fiduciary responsibility to manage all wildlife, big and small, for current and future generations.

Cervids

The history of white-tailed deer (*Odocoileus virginianus*) in North America is one of boom, then bust, then boom again. When European settlers first arrived, they encountered abundant deer populations and no regulations that protected them from exploitation. Deer populations were locally extirpated, laws were enacted (and ultimately enforced), and restocking efforts occurred throughout much of their historic range (see Adams and Hamilton 2011; Organ 2018). These efforts lead to recovery throughout North

America, and by the start of the 21st century, deer populations were at levels not seen historically. Much of this recovery is due to our trust obligation; however, the adaptability of white-tailed deer and their ability to live in a variety of human-altered habitats was a contributing factor. As Geist (1998) accurately notes:

> The American white-tailed deer (*Odocoileus virginianus*) is the oldest deer species alive. It is an expert in surviving predation of diverse forms and, like other old North American indigenous mammals, adjusts remarkably well to human activity, to cities, and to agriculture. It is a deer of ecological havoc, a survival virtuoso.

This success story resulted in deer being the most abundant and pursued big game animal in North America. In 2011, nearly 11 million people spent $18 billion hunting deer (Southwick Associates 2012). Although license fees are a fraction of overall spending, they fund the operations of most state wildlife agencies, who are reliant on these fees and federal reimbursements to deliver management and conservation activities for wildlife and their habitats (Organ, Mahoney, and Geist 2010).

Minnesota History—Captive Cervids

In 1858, legislators from the new state of Minnesota published their first statutes addressing hunting. Like other states, they were simple and only prescribed closed seasons; you could not take "deer and elk" between the first day of February and the first day of September (Minnesota Statutes 1858). There were no laws restricting domestication of any species, and there were no game wardens to enforce these rudimentary laws. More than 50 years later, the first law specifically addressing captive cervids was published in 1905; specifically, Chapter 32, Section 2249 ("Breeding Deer, etc.") prescribed (Revised Laws of Minnesota 1905):

> Any person desiring to breed or domesticate any deer, moose, elk or caribou within this state, shall make application to the board of game and fish commissioners of this state for permission to so breed or domesticate any of the said animals…

The cervid domestication statute was amended in 1913 to require a permit from the newly created game and fish commission (Minnesota Statutes 1913). With previous case law determining that wildlife is a public resource (e.g., Martin v. Waddell 1842; Geer v. Connecticut 1903) and the increasing understanding through federal laws addressing wildlife commerce and take (e.g., Lacey Act 1900; Migratory Bird Treaty Act 1918), it was in 1919 that wild animals in Minnesota became property of the state (Minnesota Statutes 1919):

> The ownership of wild animals, so far as they are capable of ownership, is hereby declared to be in the state, not as a proprietor, but in its sovereign capacity as the representative and for the benefit of all its people in common.

Despite the State's designation as the sovereign for native wildlife, individuals were permitted to take animals out of the wild and confine them (via fence) on private land. No historical records exist as to how many cervids were domesticated under these statutes or how many were behind fences when it became illegal to take deer and elk out of the wild in 1941 (Minnesota Statutes 1941):

> No wild or native deer may be taken or had in possession at any time for propagating, exhibition, or pet purposes except as hereinafter authorized. All deer now contained on licensed game farms, private and public parks

> and zoos, and the progeny of such deer may be bought and sold or otherwise disposed of only when alive…

More than 50 years later, the 1993 Minnesota legislature created a series of statutes under the Department of Agriculture that formally recognized captive cervids as "livestock and not wild animals for purposes of game farm, hunting, and wildlife laws" (Minnesota Statutes 1994). Today, the Minnesota Board of Animal Health has regulatory authority over captive cervids, and data are protected under agriculture privacy laws. The public, including wildlife agency staff, are not privy to data unless "the board determines that the access will aid in the law enforcement process or the protection of public or animal health or safety" (Minnesota Statutes 2017a).

In April 2018, there were 398 registered herds (423 captive cervid facilities) in Minnesota, which contributes to the approximately 10,000 captive deer and elk breeding and shooting facilities in the United States (The Wildlife Society 2013). There are an unknown number of shooting facilities in Minnesota, as they are not specifically regulated above United States Department of Agriculture guidelines that govern processing of livestock.

The Quest for Goliath

Goliath was born on a Pennsylvania deer farm in 1997 and grew up to be the biggest buck ever measured and the most famous captive cervid to date. He was bred, coddled, stolen and recovered, and the subject of criminal and civil lawsuits because of the absurdly large antlers he carried. He was also revered by deer farmers and hunters alike, who blogged about someday harvesting a trophy like Goliath. Unfortunately (or fortunately), exactly none of the 11 million U.S. deer hunters will harvest a deer like Goliath outside a deer pen. Goliath died unexpectedly of unknown causes on December 6, 2004, at 7.5 years old. We do not know if he was tested for chronic wasting disease.

Although White and Valdez (1987) laid out a cogent argument about the benefits of game ranching, the world that is cervid farming has profoundly changed in the last 40 years. In our example, we are not talking about fee-based hunting (of wild animals) or private land programs that encourage conservation, nor are we referencing what state wildlife agencies and hunting organizations deem "ethical hunting" (Rasker, Martin, and Johnson 1992; Peterson 2014). Rather, we discuss high-fenced shooting pens (often called "canned hunts"), selective breeding, and the sale of livestock that have their roots in the wild. Thus, we should also not confuse other programs (e.g., leasing of private lands, block or walk-in access programs, or permits provided to landowners) with antlered livestock raised for the express purposes of slaughter using firearms. Captive cervid owners prefer to be regulated by agricultural agencies, partly because of the gentler hand they receive (described as "regulatory capture"; Sabatier 1975; Thaw 2014). However, from the perspective of their shooting activities, captive cervid owners always prefer to refer to the activity as "hunting." This creates a confusing system where state wildlife agencies are often criticized for not enforcing captive cervid regulations, when they, in effect, have no authority to enforce those regulations.

In the absence of disease, the fencing of previously wild animals (regardless of generation) constitutes a violation of every tenet of the Model. In his essay "The Antler Religion," Knox (2011) wrote about what he called "intensive deer management," which he characterized by high fences, supplemental feeding, and selective breeding. Knox echoed what many agency staff silently believe (and cannot publicly say)—that the privatization and commercialization of cervids not only erodes the Model, it makes it extremely difficult to defend recreational deer hunting to nonhunters. The 90% of nonhunting Americans will not make the separation between fair chase hunting and shooting livestock behind a fence. In addition, when white-tailed deer become nothing more than "antler delivery systems," we devalue the species as a whole and put ourselves in a precarious position that cannot be defended (R. Bronson, pers. comm.). Thus, the hidden cost of privatized wildlife unfortunately includes hunters who are wrapped up in tales of Goliath, the X-Factor, or deer with other names that signify our antler obsession. Indeed, the 30-minute hunting infomercials that depict the harvest of huge antlered deer contribute to a problem of skewed public perceptions related to managing wild populations. Unless stated explicitly, we never know

if the animal is wild or livestock, as an ear tag will be not seen in pictures or on film. Indeed, searching for penned shooting pictures of dead deer still with their ear tags is a very difficult task.

The Tragedy that is Chronic Wasting Disease

Chronic wasting disease (CWD) should be considered the most important disease impacting cervids in North America. CWD is a transmissible spongiform encephalopathy or "prion" disease of cervids (deer, elk, and moose). The susceptibility of all the deer species to this fatal disease, its environmental persistence, and the methods by which it moves on the landscape is problematic for state wildlife agencies. The disease was first described in 1967 and became well known to western wildlife managers in the early 1980s (Williams and Young 1980; Spraker et al. 1997; Miller et al. 2000). Retrospectively, it is not possible to determine if CWD first occurred in captive or free-ranging animals; however, the movement of captive cervids has expanded the geographic distribution of the disease (Williams et al. 2002; Williams and Young 1992; Gerhold and Hickling 2016). Chronic wasting disease continues to spread across North America, primarily through live animal movement either naturally in migrating wild populations, movement of captive cervids, or, in some cases, translocated free-ranging restoration programs. Currently, the disease is found in 25 states and two Canadian provinces (Plummer et al. 2018).

The list of risk from captive cervids is long and includes escapes, comingling of captive and wild animals, and potential for disease transmission (Fischer and Davidson 2005; Gerhold and Hickling 2016). For state wildlife agencies, the greatest threats are disease transmission and the long-term costs associated with live cervid movements. While movements of wild cervids can be prohibited by wildlife agencies, captive cervid movements are typically regulated by agricultural agencies. Financially, wild CWD management most often falls to the states and the people who purchase hunting licenses. Since 2002, Minnesota has spent $7.1 million on its CWD response program, of which 96% were state funds (83% from license fees). In contrast, from 2003 to 2017, $9.9 million in U.S. taxpayer dollars have been expended to purchase diseased cervids (Adams 2017). The disparity between hunters paying for CWD response (regardless of infection source) and the general public paying for indemnification is unsustainable in the long-term, especially considering the long-term hunter number declines that are exacerbated by CWD infection (Heberlein 2004).

Herpetofauna

Regulation of herpetofauna presents an equally challenging, yet unique, set of circumstances as compared to their cervid counterparts. Native herpetofauna are collected for a variety of private uses including pet trade, human consumption, bait, teaching, research, traditional medicine, skin products, and captive breeding. Many people first develop their enthusiasm for wildlife at a young age through exposure to amphibians and reptiles (Nanjappa, Gardner, and Riexinger 2014). Wildlife agencies have avoided regulations that prevent kids from hand-capturing a salamander in their backyard or dip-netting a tadpole at a local pond to learn about metamorphosis. While state regulations for game species are well defined, they are less clear and vary widely across states for nongame species, such as amphibians and reptiles. As of 2011, 41 states allowed some form of commercial harvest of native herpetofauna, and 48 states allowed personal or hobby collection, with three of these 48 allowing unlimited collection of unprotected species for personal use (Nanjappa and Conrad 2012). Only 28 of the 48 states required a permit for personal or hobby collection, and a mere 10 states required reporting on what was collected (Nanjappa and Conrad 2012). Because we lack information about the numbers, species, and locations where nongame animals are harvested, it is difficult to assess whether current regulations surrounding collection and harvest are adequate to sustain native populations.

To further complicate matters, amphibians are among the most imperiled groups of organisms on earth with an estimated 41% of species globally threatened or extinct (IUCN 2017). Data is deficient for reptiles, but based on an analysis of 1,500 species, an estimated 19% are at risk of extinction (Böhm et al. 2013). Therefore, privatization of herpetofauna may put additional strain on a resource already considered

vulnerable on a global scale. This creates additional challenges when applying core principles of the Model to amphibian and reptile management, particularly with respect to the public trust obligation, legitimate take, and the use of best available science to inform policy decisions.

Minnesota History—Herpetofauna Regulations

Sixty-five years after statehood, the Minnesota legislature enacted the first laws addressing turtles and frogs under the "Preservation of Game" statute (Minnesota Statutes 1923a, 1923b). Turtles could be taken, possessed, bought, sold, and transported for any reason and by any method at any time. Frogs could be taken, possessed, bought, sold, and transported within the state by any method at any time for bait and scientific purposes, but a seasonal restriction was put in place for commercial purposes (Minnesota Statutes 1923a, 1923b).

In later years, the legislature amended the statute a number of times to specify seasons, size restrictions, bag limits, purposes of use, and, ultimately, license fees for the commercial take, transport, purchase, possession, or selling of turtles and frogs. In 1986, Minnesota enacted game and fish laws that defined frogs, turtles, and other specific groups of species as protected wild animals. This designation made it illegal for a person to take, buy, sell, transport, or possess these species unless otherwise allowed under game and fish laws, such as with an angling license or special permit (Minnesota Statutes 1986). Other species of herpetofauna, unless listed as endangered or threatened, remained unprotected and without restrictions on use until 2017 when the definition of "protected wild animals" was modified to include salamanders, snakes, and lizards (Minnesota Statutes 2017b). As of December 2017, there are 23 commercial turtle harvest licensees in the state, 12 commercial frog licensees, and an unknown number of amphibian and reptile sellers. Trade shows, expos, swap meets, and flea markets have little oversight, though sellers are expected to comply with state laws regarding importation, commercial sale, endangered and threatened species, permit requirements, and other applicable restrictions.

Challenges Associated with Herpetological Trade

The hidden costs associated with private ownership of wildlife extend far beyond big game; they affect the slimy, scaly, and furry, too. While many users in the herpetofaunal community are good stewards of the resource and promote positive amphibian and reptile conservation practices, there are multiple challenges associated with privatization that result in substantial economic, societal, and ecological costs. Three of the biggest threats to amphibian and reptile populations that have been exacerbated by international trade are the spread of deadly diseases, the introduction of nonindigenous species, and over-collection from both legal and illegal harvest. These threats can translate to exorbitant costs bore by wildlife agencies for disease testing, invasive species control, and monitoring of impacted species populations. In addition, private ownership of wildlife makes it very difficult for agencies to enforce wildlife regulations and to effectively manage native species, particularly endangered and threatened species.

Disease. We now know of two crippling amphibian diseases, the spread of which has been assisted by global trade. In the past several decades, chytrid fungus (*Batrachochytrium dendrobatidis*) has been implicated in the decline and local extirpation of more than 200 species of amphibians (Skerratt et al. 2007). How long chytrid has been present in the environment in some parts of the world and whether it has increased in virulence is up for debate; however, it has been well documented that international trade has contributed to its spread to new locations across the globe (Kolby and Daszak 2016; Weldon et al. 2004; Fisher and Garner 2007; Schloegel et al. 2009). Evidence is mounting that a newly discovered and closely related salamander fungus (*Batrachochytrium salamandrivorans*), thought to be native to Asia, was introduced to wild salamanders in Western Europe by the trade of Asian newts. This fungus is a catastrophic threat to the United States, which serves as the global hotspot of salamander diversity. In 2016, 201 species of salamanders were listed under the Lacey Act as injurious to help prevent the spread of this deadly fungus into the U.S. (USFWS 2016).

Invasive species. As with disease, we could tell a tale of similar woe about the spread of invasives due to intentional release of unwanted animals or accidental escape from private collections. These are

stories with which we are familiar, such as Burmese pythons in Florida, which have devastated marsh rabbit and fox populations and changed the ecosystem of the Everglades. Florida has the worst nonnative amphibian and reptile problem in the world with 137 species being introduced from 1863 through 2010 (Krysko et al. 2011; Eason et al. 2018). Current laws around release are simply not enforceable. Restrictions on the import and export of nonindigenous species are necessary if we want to curb the spread of invasives and disease.

Over-collection. Illegal wildlife trafficking is one of the world's most lucrative crimes and extends well beyond rhino horns and elephant tusks (Wyler and Sheikh 2013). Consumer demand for amphibians and reptiles is increasing, especially for rare, more commercially valuable species (Cheung and Dudgeon 2006; Auliya et al. 2016; Hall, Milner-Gulland, and Courchamp 2008). While collecting for the black market is a monumental problem, commercial harvest and even opportunistic collecting by hobbyists with harmless intentions puts pressure on native populations, particularly of long-lived species like turtles with low fecundity and late age of maturity.

Enforcement of regulations. It is rare to catch individuals in the act of illegally collecting animals from the wild or releasing nonnative, unwanted pets. Therefore, law enforcement officers have a difficult task trying to enforce regulations, for example, discerning whether herpetofauna in a person's possession were wild-collected or captive-bred. Investigation of suspected violators takes tremendous enforcement effort, and agencies may not have sufficient capacity to pursue prosecution for all cases of illegal activity. Penalties for regulation violations are often minor and may be perceived as the cost of doing business rather than as a deterrent. In Minnesota, no wildlife poaching violations are considered felonies, even for endangered and threatened species, regardless of how egregious the violation. Across the U.S., only 14 states have penalties that may exceed $2,000; 22 states allow for possible jail time; and only eight states have sentencing that may equal or exceed one year (Nanjappa and Conrad 2012).

Inability to appropriately manage populations. Education is arguably the most effective wildlife conservation tool, increasing public awareness about the value of wildlife. However, providing information about rare amphibians, reptiles, and the habitats where they live can backfire because even a single unscrupulous collector can wipe out local populations. Poachers are savvy. They attend scientific conferences and conservation group meetings waiting for researchers to divulge their study sites; they scour scientific literature looking for published locations of threatened and endangered species; and they use this information to exploit rare species populations which can lead to local extirpation. Biologists may not even support listing a species as endangered or threatened because they are concerned about making a species more commercially valuable, resulting in improper protection and management priorities (Rivalan et al. 2007).

Reevaluating Wildlife Allocation and Markets—Case Studies in Nevada and Minnesota

In order to fulfill their public trust obligation, state wildlife agencies have to make controversial decisions to protect the long-term sustainability of the resource. The state of Nevada is one of the most recent in a growing number of states to prohibit commercial collection of reptiles. In September 2017, the Nevada Board of Wildlife Commissioners voted to end the issuance of commercial reptile permits effective January 1, 2018, basing their decision in part on evidence that collection activities violated core tenets of the Model (Nevada Board of Wildlife Commissioners 2017). Prior to the ban, collectors paid $250 for an annual license that allowed collection of unlimited numbers of reptiles so long as they reported their take on monthly logs (Nevada Administrative Code 2018). Based on these logs, the Nevada Department of Wildlife calculated that more than 450,000 native reptiles had been legally removed from the wild in the past 30 years (Nevada Department of Wildlife 2017). One collector reported harvesting an average of 83 reptiles per day, totaling thousands during a five- to six-month period in 2016 (Newark 2017). With similar concerns about the unsustainability of collection on turtle populations, Missouri instituted a complete ban on commercial turtle harvest in March 2018, and Iowa set more restrictive bag limits and seasons on both commercial and recreational turtle harvest.

In 2004, Minnesota went through a rulemaking process to phase out commercial turtle harvest in an attempt to protect the state's populations of snapping, painted, and spiny softshell turtles from

unsustainable levels of harvest. The Department of Natural Resources stopped issuing new commercial licenses, but existing license holders were allowed to keep and renew their annual licenses. The revised regulations established new trapping and reporting requirements but intentionally avoided setting limits on the number of turtles or pounds that could be harvested per year because it would be costly to enforce. Instead, a limit was placed on the number of traps that could be operated at any given time to keep harvest numbers at a sustainable level. In 2015, Minnesota issued 23 commercial turtle harvest licenses, less than half of the 51 licenses that were issued in 2003 prior to the regulation change. However, monthly logs submitted in 2014 and 2015 show that the number of turtles harvested is nearing 2003 levels (Figure 1). Despite attempts to sunset commercial turtle harvest, harvest pressure on Minnesota's turtles has increased at the same time that regulations have tightened in other states and demand for turtles overseas has skyrocketed (e.g., Colteaux and Johnson 2017). Additional years of data will help illuminate whether this increased harvest trend holds or if it is a two-year anomaly. Regardless, it is imperative to acknowledge that both regulatory changes (i.e., supply) and market demand outside a state's administrative boundaries can have a profound impact on wildlife resources, and these outside factors should be considered when making regulatory decisions on resource sustainability.

Let us stress that we do not have all the answers. In fact, when it comes to management of nongame species such as amphibians and reptiles, funding deficiencies limit the ability to collect population-level information. Although the Model has evolved into a user-pay, everyone-benefits model, many legal uses of herpetofauna are conducted without a fee. The fees that exist (e.g., commercial harvest licenses) do not adequately cover costs for management, research, monitoring, and analysis. Nongame species comprise the vast majority of wildlife diversity that natural resource agencies are tasked with managing. However, the traditional types of license fees and federal excise taxes on hunting, shooting, and angling equipment that have provided dedicated funding for game species management and conservation initiatives do not exist for nongame species. Applying principles of the Model consistently and equitably across all groups of wildlife will require a proactive approach with dedicated funding and broadscale citizen engagement (Organ et al. 2012).

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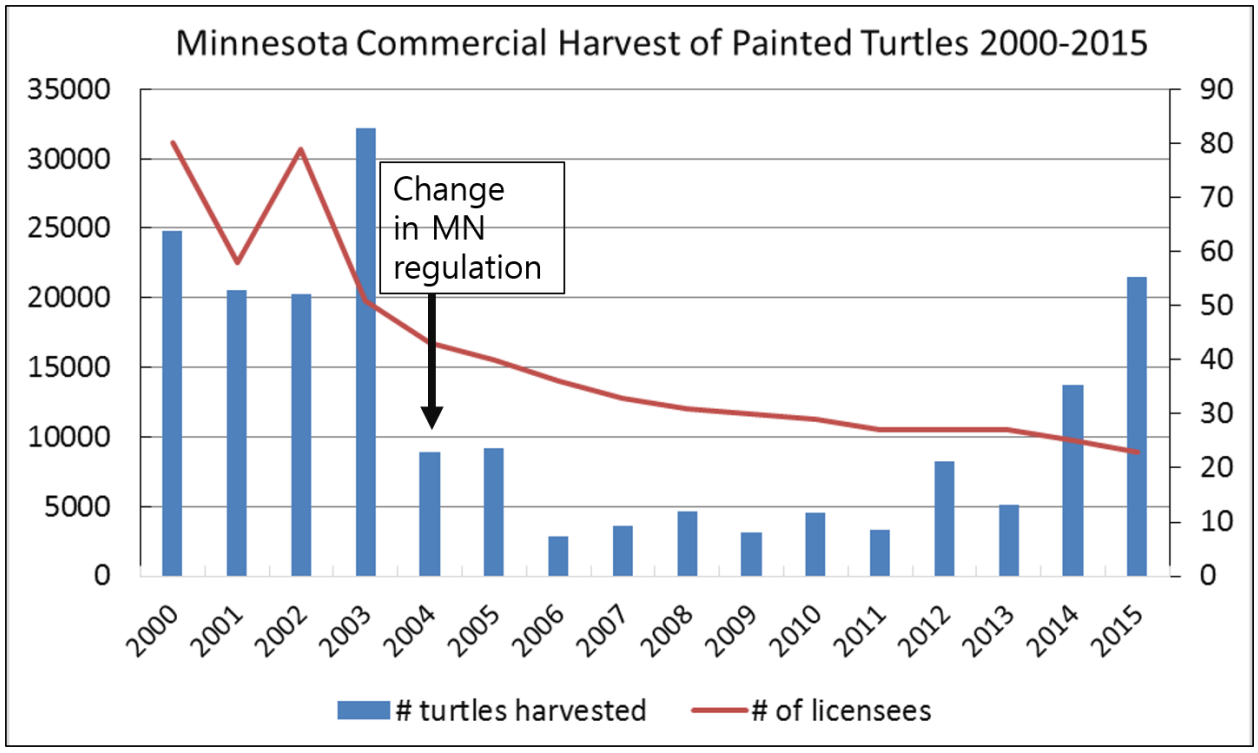
Figure 1. The number of commercial turtle licensees in Minnesota and their reported harvest of painted turtles between 2000 and 2015 (Minnesota Department of Natural Resources, unpublished data). In 2004, regulations were revised to slowly phase out commercial harvest in the state.



The Tragedy of the Commons: Exploring the True Cost of Fish and Wildlife Crimes

Kristie R. Blevins
Eastern Kentucky University
Richmond, Kentucky

Jonathan Gassett
Wildlife Management Institute
Georgetown, Kentucky

Introduction

There is a large body of research concerning the impact of wildlife crimes globally, which generate billions of dollars in illegal income for offenders each year, and there is no doubt that these crimes have had detrimental consequences for entire species and the community residents who depend on them (Kurland et al. 2017; Zimmerman 2003). There is, however, a significant gap in the literature in that few studies examine the impact of violations of state fish and wildlife regulations and statutes domestically. The study presented here will help to fill this void by estimating the average annual economic impact of fish and wildlife violations in Kentucky.

In the early United States, wildlife came to be seen as property of the collective citizenry, not of a sovereign body (Palmer and Bryant 1985). This principle is part of the first (of seven) tenets in the current North American Model of Wildlife Conservation (the Model). Often referred to as the public trust doctrine of the Model, the tenet also asserts that states are responsible for regulating and preserving natural resources for use by future generations (López-Bao, Chapron, and Treves 2017).

Conservation officers, sometimes referred to as game wardens, have existed since colonial times; the colony of Massachusetts appointed its first "game protector" in 1739 (Sherblom, Keranen, and Withers 2002). In 1887, Michigan became the first state to create full-time, paid law enforcement positions devoted to the enforcement of wildlife statutes; and by the early 1900s, most other existing states had created their own agencies charged with enforcing wildlife statutes (Falcone 2004).

Study Background

The agency responsible for the management of wildlife in Kentucky is the Kentucky Department of Fish & Wildlife Resources (KDFWR). This agency was originally called the Kentucky Game and Fish Commission when it was created on March 12, 1912. The original agency contained only two divisions: fisheries and law enforcement. The law enforcement division's sole responsibility was the enforcement of wildlife statutes. While the number of game wardens hired the first year of their existence is unknown because of the political nature of their appointments, Kentucky's first game wardens were paid $25 a month, with bonuses for fines and convictions (KDFWR 2010).

KDFWR has operated in its present form since 1944. The agency receives no state tax dollars and derives its budget from license sales, boat registration, and federal grants (KDFWR 2010). The law enforcement division is now one of seven divisions in the department that operate collectively, and the law enforcement agents are known as conservation officers. Kentucky's conservation officers enforced only laws related to fish and wildlife statutes until 1986, when Kentucky's General Assembly expanded their powers to include the ability to cite and/or arrest for the violation of any state laws. In 1996, water patrol officers were merged with traditional conservation officers. Presently, all officers in the resulting law enforcement division of KDFWR are responsible for wildlife and boating law enforcement and, like conservation officers in most states, have the ability to issue citations and arrest individuals who violate any state law (Blevins and Lanham 2013; Eliason 2007; Falcone 2004; Sherblom, Keranen, and Withers 2002).

Law enforcement divisions within fish and wildlife or natural resources agencies often are among the largest policing entities within a state, yet there have been few studies dedicated to domestic fish and

wildlife crimes, those who commit them, and officers who enforce related laws and regulations. This oversight is likely related to the fact that the seriousness of most crimes is judged based on physical or economic harm to victims, so conventional criminal justice and criminology scholars may be less likely to pursue lines of research involving crimes that do not have identifiable human victims (Michel 2016; Wellsmith 2011).

Scholars seem to have taken more of an interest in fish and wildlife crimes during the last two decades, but the vast majority of publications on the topic tend to focus on typologies and/or motivations of violators or occupational reactions and responsibilities of conservation officers (Blevins and Edwards 2009; Blevins and Lanham 2013; Carter 2004; Clifford 1998; Eliason 2003a, 2003b, 2004, 2007, 2008; Falcone 2004; Forsyth, Gramling, and Wooddell 1998; Green 2002; Green, Phillips, and Black 1988; Muth and Bowe 1998; Serenari and Peterson 2016; Shelley and Crowe 2009; Sherblom, Keranen, and Withers 2002; Weisheit, Falcone, and Wells 2006). The purpose of our study is to estimate the economic impact of fish and wildlife crimes in Kentucky. Results of this empirical study may be used to educate individuals about the seriousness, in fiscal terms, of fish and wildlife crimes to its human victims—the public and officials entrusted to conserve natural resources for future generations.

Methods

Data Sources

The secondary, statewide data were obtained from a variety of sources. Information concerning fish and wildlife violations and the associated penalties came directly from Chapter 150 of the Kentucky Revised Statutes (KRS) (Kentucky Legislature 2018). De-identified violations cited by KDFWR conservation officers were provided upon request by KDFWR for 2006 through 2011 and Kentucky State Police for 2012 through 2017. The combined data set contained 46,570 fish and wildlife violations; 18,906 boating violations; and 17,004 other violations. The 46,570 fish and wildlife violations were aggregated by type and analyzed for this study.

Case dispositions for each KRS Chapter 150 violation appearing in district and circuit courts were acquired via a data request from the Kentucky Court of Justice's Administrative Office of the Courts. This information contained the total numbers of various dispositions for fish and wildlife violations throughout the state during 2006 through 2017. Dollars recovered via the courts in terms of fines and restitution were acquired from KDFWR. The last source of secondary data was the U.S. Fish & Wildlife Service's (USFWS) Historical License Data Index, from which annual hunting and fishing license revenue information for Kentucky was retrieved (USFWS 2018).

Cost Estimates

While it is difficult to assign an economic value to wildlife, KRS 150.995 specifies restitution for illegally taken bear ($1,000), turkey ($500), and bobcat ($500) (Chardonnet et al. 2002; Herath and Prato 2016). Standard replacement costs for deer ($742) and elk ($2,500) are available in KDFWR policy. When a violation was coded so that the type of animal illegally taken could be identified, these values were used where applicable. For violations that did not identify the species taken, as well as for all other illegally taken species, the minimum fine ($100), per KRS 150.990, was used. The economic value for fish and wildlife violations that did not involve illegally taking wildlife or license violations were also based on the statutory minimum fine ($50 to $200) for the specific violation. Lost revenue from license violations was calculated based on the yearly average revenue from hunting and license sales based on historical licensing data. It is important to note that revenue based on license sales is not simply the cost of required licenses and tags; there is a federal apportionment from sources such as excise taxes on firearms and ammunition (USFWS 2018).

Findings

There were 46,570 violations of KRS Chapter 150 cited by KDFWR conservation officers from January 1, 2006, through December 31, 2017. These violations were divided into three categories:

1) license violations (22 statutes; 23,765 violations; 51.03% of violations cited);
2) illegal take violations (15 statutes; 10,455 violations; 22.45% of violations cited); and
3) other fish and wildlife violations (e.g., entry on land to hunt, fish, or trap without consent and intentional obstruction of lawful taking of wildlife; 59 statutes; 12,350 violations; 26.52% of violations cited).

Because the number of violations cited each year varies based on a number of factors—such as number of staff, hours worked in the field versus other tasks (e.g., community outreach and education), and policy changes—the number of violations was averaged for the 12-year study period.

Figure 1 contains a breakdown of the number of license violations and associated revenue by year. The fewest (n=1,077) license violations were cited in 2011, while the most were cited in 2013 (n=2,742). On average, there were 1,980.42 license violations cited each year, resulting in more than $68,000 in revenue lost annually.

As shown in Figure 2, as many as 1,452 (2007) and as few as 429 (2017) illegal take violations were cited in a single year. The mean number of violations detected each year was 871.25. Using replacement costs when possible, and minimum statutory fines otherwise, the average cost of illegal taking of wildlife violations was almost $865,000.

Information for all other fish and wildlife violations cited is presented in Figure 3. More of these violations were cited in 2008 (n=1,437) and 2016 (n=1,372) than in other years, and the fewest violations were cited in 2017. The average number of these other violations was 1,029.17, which, based on the statutory minimum fine for each violation, equated to an annual economic loss of $73,421.

Taken together, the data indicate that KDFWR conservation officers cited an average of 3,880.83 fish and wildlife violations per year, which, based on the estimates used in this study, have an economic impact of more than $1 million annually for the state, conservation efforts, and the community, in general. The estimates for the violations alone, however, are not the only considerations concerning costs. For example, the statutory penalties for some fish and wildlife violations mandate that violators shall forfeit his or her license and/or the privilege to hunt or fish for one to three years. In those cases, there is lost license revenue for individuals who would have bought hunting or fishing licenses during that time period. There were, on average, 583.75 of these violations per year for the study time period, which means that, based on mean revenue per license holder ($96), license privileges being revoked for the minimum one-year results in a potential economic loss of $56,040 per year (see Figure 4 for a summary of the estimated economic costs of fish and wildlife crimes).

Another factor that must be considered is the dark figure of fish and wildlife crimes. This dark figure is comprised of violations that are not reported to or otherwise detected by officials. It is difficult to assess the true dark figure of any type of crime, but it is especially challenging for so-called victimless crimes or offenses for which there are no victims to be surveyed or interviewed. A large percentage of offenses in general are unknown to authorities. For instance, about 52% of violent crimes (rape or sexual assault, robbery, aggravated assault, and simple assault) and 60% of household property crimes (burglary, motor vehicle theft, and theft) go unreported—and these percentages are much greater for crime with no direct victim (Langton et al. 2012). It is often noted that only a very small portion of fish and wildlife crimes are detected, with detection rates reported in the range of 0.67 to 3.33% (Green 2002; Green, Phillips, and Black 1988; Kaminsky 1974; McMullan and Perrier 2002; Smith 1982; Vilkitis 1968; Wellsmith 2011; Wyatt 2016). For our purposes, we used the midpoint of these estimates: a 2% detection rate or a dark figure of 98% of fish and wildlife crimes considered undetected. If these numbers are accurate, the average annual financial impact of fish and wildlife crimes in Kentucky is more than $50 million.

Of course, some of the total financial impact should be mediated by financial penalties issued by the courts. Per KRS 150.160 and 150.990, KDFWR is to receive 60% of fines and 100% of replacement or other costs ordered as restitution for fish and wildlife violations. As reported in Figure 4, KDFWR, on average, recovered less than $110,000 from fines and restitution per year, which does little to offset the estimated costs of even known violations.

The estimated economic impact of fish and wildlife crimes in Kentucky presented here is significant. If the dark figure is included, the average yearly impact is more than four times the annual budget for KDFWR law enforcement—and there are other costs that could be included that would increase these numbers even more. For example, based on court dispositions requiring jail or prison time, taxpayers were responsible for a minimum of $125,000 of incarceration expenses per year. Additionally, illegal take or damage to the habitat of endangered species could have financial and other costs far greater than penalties imposed by statute.

Conclusion and Suggestions for Future Research

Results of this research are meaningful because they demonstrate that fish and wildlife violations should not be considered trivial law violations. It can be difficult to show the effect such violations have on particular species, habitat, and the environment, in general, but these findings show the estimated economic impact of these violations is significant even when using minimal values. This information can be used to educate the general public, lawmakers, judges, and other officials about the importance of fish and wildlife violations.

This study also has resulted in some questions that we hope to address through future studies. First, most estimates of the dark figure of fish and wildlife crime are dated, based on small samples, or have some potentially problematic methodological issues. As with any supposed victimless crime, approximating the amount of undetected violations will be an arduous process, but it is necessary to understand the full scope of the problem. We hope to examine the dark figure through self-reported information, as well as a quasi-experimental study design based on numbers of conservation officers.

Second, it is important to continue studies that help us understand motivations for violating fish and wildlife laws, but it is also important to investigate why others do not violate those laws and regulations. Is there something specific that deters them? If so, is it more about legal consequences, morality, an understanding of implications of violations in regard to conservation, or something else? Perhaps a greater knowledge base concerning why people do and do not commit these types of violations will lead to strategies that help combat the problem.

Last, we plan to explore court dispositions of fish and wildlife violations and their consistency with statutory penalties. Court data were aggregated and only contained information about the number of times a particular penalty was ordered. That is, these data did not include specific amounts of fines, restitution, or length of incarceration ordered. Nevertheless, it appears as though restitution was ordered in only a very small percentage of cases for which KRS mandate restitution ($\bar{x}$=577.17 cases per year). A study of detailed dispositions for a large sample of violators cited for a variety of different violations in different counties should be helpful in determining if court orders are consistent with penalties stipulated in KRS. If there are inconsistencies, as there appear to be based on the aggregate data, interviews with judges will be conducted to examine this issue in more detail, as leniency and negligible penalties are often cited as factors that contribute to fish and wildlife violations (Serenari and Peterson 2016; Wellsmith 2011). Further, a study commissioned by the Boone and Crockett Club found that, even though restitution can be ordered for illegally taken big game in at least 42 states, several state agencies have reported problems in getting restitution ordered and/or collecting restitution in relevant cases (Edwards 2017). These difficulties with restitution were so prevalent that the Boone and Crockett Club implemented its Poach and Pay Program to assist agencies with matters such as education and outreach to officials and the general public.

We hope the information presented here shows that fish and wildlife violations are important issues. Although these violations may have consequences well beyond financial implications, our intent

was to put together these economic estimates as quantifiable evidence that they should not be overlooked as serious conservation and criminal justice topics. We are optimistic that this research, in conjunction with additional studies in Kentucky and other states, can be used to illustrate the seriousness of fish and wildlife violations and ultimately lead to policies that will reduce the number of violators and violations.

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Figure 1. Lost revenue due to detected license violations ($\bar{x}$=$68,123 for 1,980.42 violations per year).

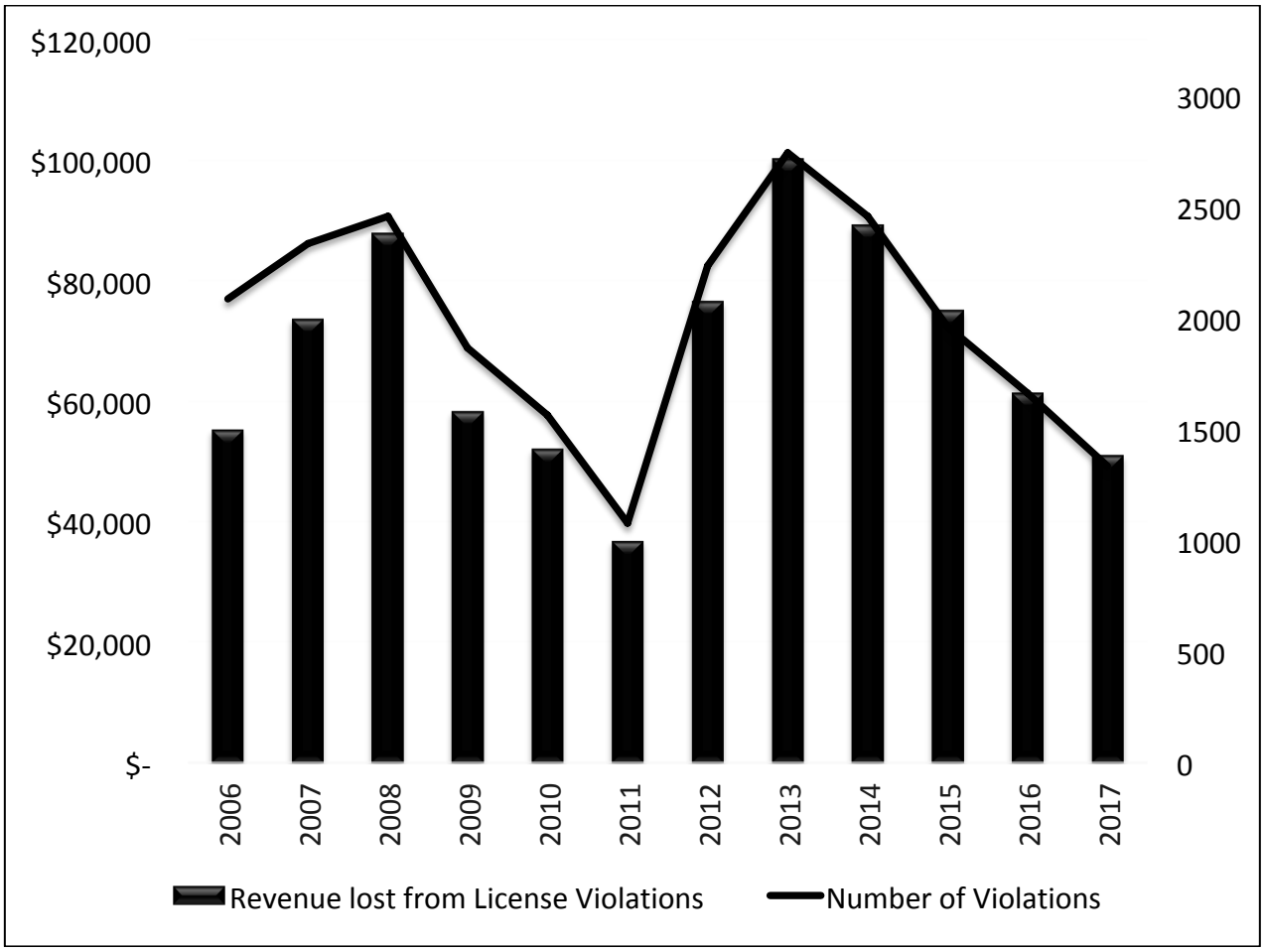

Figure 2. Economic cost from detected illegal take violations ($\bar{x}$=$864,778 for 871.25 violations per year).

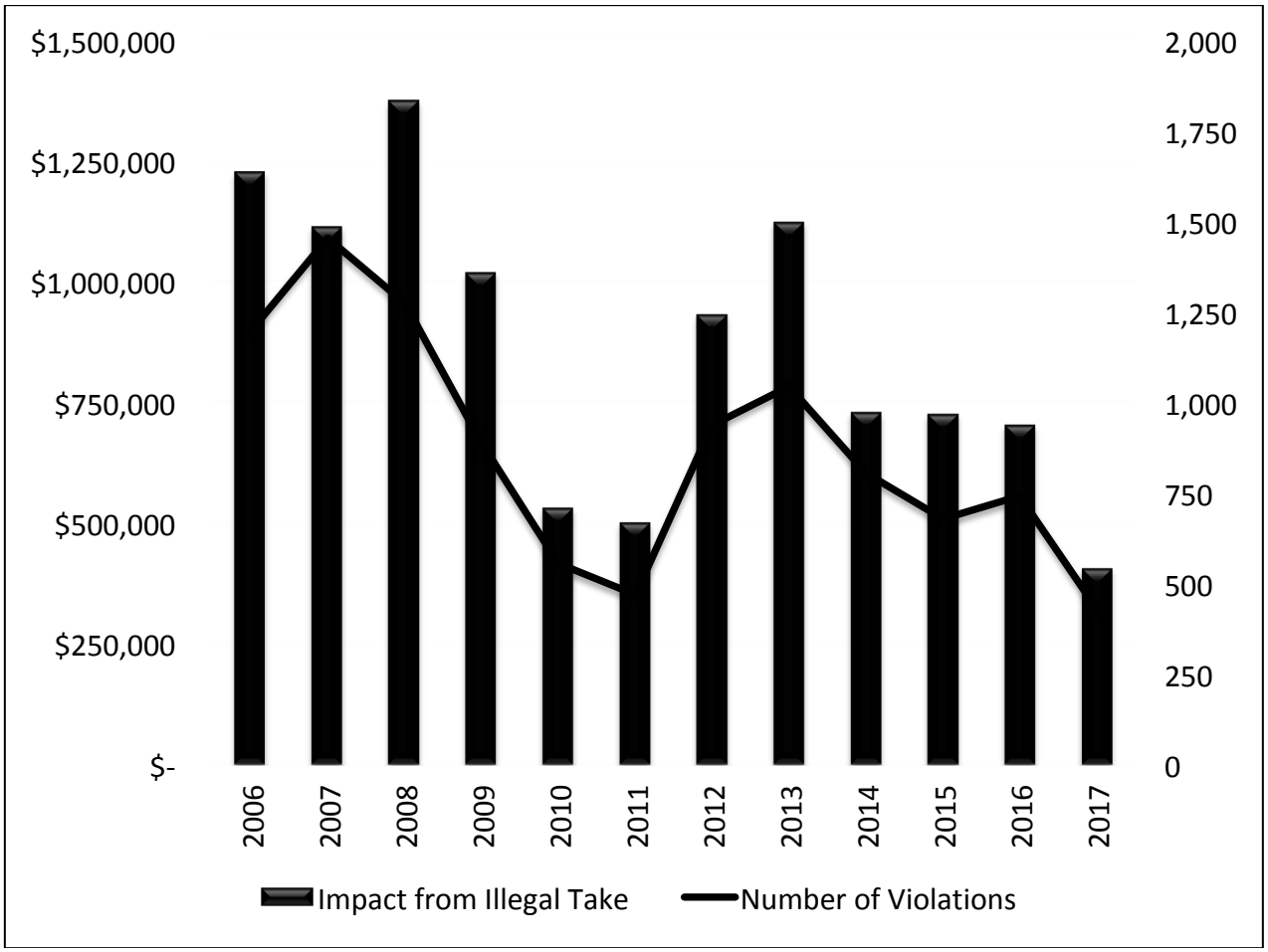

Figure 3. Economic impact from other detected fish and wildlife violations ($\bar{x}$=$73,421 for 1,029.17 violations per year).

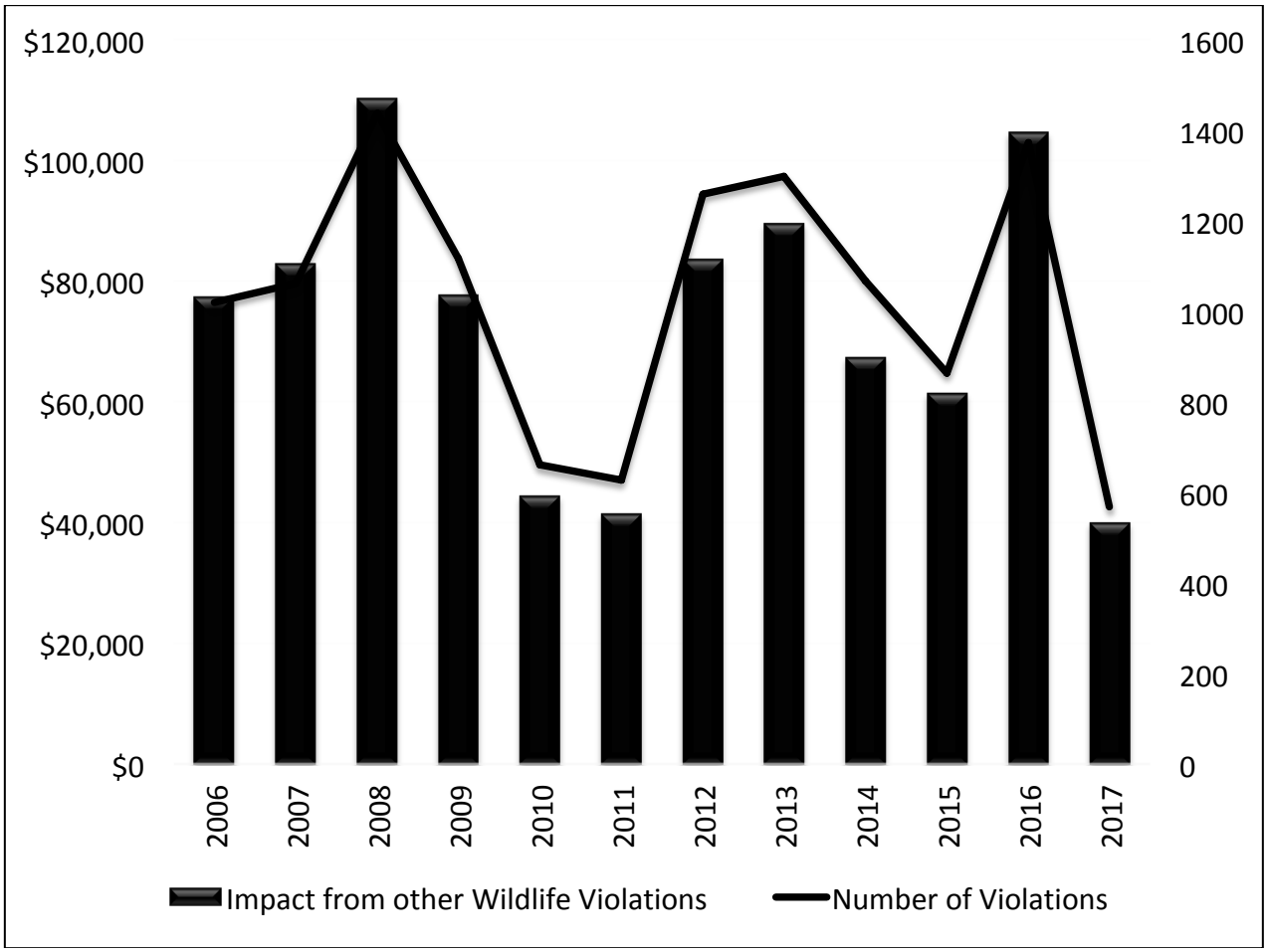

Figure 4. Average economic impact of known fish and wildlife violations in Kentucky per year.

Estimated Yearly Economic Impact of Detected Fish and Wildlife Violations in Kentucky	
License Violations	$68,123
Illegal Taking of Wildlife Violations	$864,778
Other Violations	$73,421
Subtotal	$1,006,322
License Suspensions	$56,040
Subtotal	$1,062,362
Dark Figure (undetected violations)	$52,055,738
Subtotal	$53,118,100
Recovered, Fines Collected	-$94,981
Recovered, Restitution Collected	-$13,624
Total	$53,009,495

Does the Punishment Fit the Crime? Sentencing, Penalties, and the Wildlife Violator's Compact

Scott Talbott
Wyoming Game & Fish Department
Cheyenne, Wyoming

Wildlife poaching is often considered by society as being different than crimes against persons, such as assault, robbery, property destruction, or murder, as there is no perceived victim of the crime. Mrs. Deer does not call the authorities to file a missing animal report on Mr. Deer when he fails to come home or to report him returning home after being involved in a firearms incident. I think this is summarized well by the father of wildlife conservation Aldo Leopold:

> A peculiar virtue in wildlife ethics is that the hunter ordinarily has no gallery to applaud or disapprove of his conduct. Whatever his acts, they are dictated by his own conscience, rather than by a mob of onlookers. It is difficult to exaggerate the importance of this fact.

Law enforcement, the justice system, and in fact, all societies have contemplated appropriate and effective punishments for societal infractions throughout history. The moral compass of most is set and effectively guided by the expectations of society. The wildlife management profession shares the challenge of finding the right approach to prevent people from committing crimes and violating societal expectations.

As a backdrop to all of this, the appreciation and value of wildlife continues to increase and evolve. Technologies are advancing the ability to acquire and share information in a rapid manner to provide additional avenues to share values, perspectives, and information. A commensurate increase in the monetary and narcissistic value of wildlife trophies has continued to expand. This motivation has increased to the point that, in some cases, the temptation to illegally take certain trophy animals exceeds any consideration of exposure to established deterrents.

Those of us in wildlife management are then moved to continue to explore options for new deterrents and evaluate their individual or collective effectiveness. What does it take to protect our most valuable and majestic wildlife?

Wyoming Case Study

Prior to 1994, the fine for taking an antlered mule deer out of season or without a license was $400; there was no provision for the forfeiture of equipment, very little risk of any incarceration, and no loss of hunting and fishing privileges. The nonresident license cost at that time was $150 and an outfitted hunt cost several thousand dollars on top of other expenses. In many cases, if apprehended for the illegal take of a trophy mule deer on the winter range, it was less expensive than legally hunting during the established season. Wyoming Game & Fish Department (Department) law enforcement personnel documented several organized groups that traveled to the winter ranges of Wyoming with the specific intent to illegally take trophy mule deer. In 1994, the only confiscation provided by law was for evidentiary purposes in legal proceedings. Suspension of privileges was inconsequential and effectively stopped at the state border. Suffice it to say, local suspensions were insignificant to deter perpetrators.

Clearly, in the early 1990s, the existing fines, suspension of privileges, forfeiture of equipment, and potential incarceration were not adequate to serve as an effective deterrent to prevent the illegal take of mule deer on the winter ranges of Wyoming. Fortunately, in 1995, the Wyoming legislature passed legislation that increased fines to a minimum of $5,000 and maximum of $10,000; added imprisonment for not more than one year; or both. This change—combined with new strong forfeiture laws, significant revocation of hunting and fishing privileges (to include the potential for a lifelong suspension), and the

adoption of the Wildlife Violator Compact in many states—served as a significant deterrent to address organized illegal take of mule deer in Wyoming. While the new state law applies to all big and trophy game animals in Wyoming, the nature and incidence of winter range mule deer poaching shifted significantly. Yet, repeat violations prompted further legislative review. In 2011, the Wyoming legislature made another change that meant a third or subsequent conviction within 10 years constituted a felony punishable by a fine of $5,000 to $10,000; imprisonment for not more than two years; or both. This is Wyoming's only felony provision for the illegal take of wildlife. Only one individual has been convicted of the felony provisions since enactment. While the illegal take of mule deer continues and there are even incidents on winter range, the increased penalties have helped protect this world-class wildlife resource.

The Interstate Wildlife Violator Compact is an agreement to provide reciprocal sharing of information regarding fishing, hunting, and trapping violations and allows for recognition of suspension or revocation of hunting, fishing, and trapping licenses and permits in member states resulting from violations of applicable laws. Illegal activities in one state affect a person's hunting or fishing privileges in all member states. A conviction in one compact member state may cause an individual to be barred from participating in hunting, fishing, and trapping in all member states, at the discretion of each state.

Often the courts view the suspension of privileges a more appropriate option than long jail sentences or extremely high fines that the defendants would never be able to pay. Hunting is often a very important part of a family's lifestyle. Taking that privilege away from them sends a very strong message. The inception of the compact was in 1989. Currently, there are 47 states that are members of the compact.

Forfeiture of Devices and Equipment Used in the Taking of Big or Trophy Game Animals

In Wyoming state law, there is a prohibition on the wanton destruction of any big or trophy game animal. To add teeth to Wyoming laws that prohibit wanton destruction or intentional poaching of big game, the Wyoming legislature, in 1999, added a provision providing for the forfeiture of devices and equipment used to commit these crimes. Now, any enforcement officer of the state may seize any devices or equipment utilized in the commission of a crime as ordered by the court of original jurisdiction as provided for in statute. This has provided an additional deterrent and further protected Wyoming's wildlife.

Three current Wyoming cases demonstrate that the application of fines, incarceration, restitution, forfeiture, and the suspension of privileges are still not enough to prevent criminal activities. All three cases involve either a high-profile animal or individual.

State of Wyoming v. Billy J. Busbice Jr.

This case involves a wealthy landowner, successful businessman, owner of an outdoor products company, and hunting show host who was convicted of intentionally allowing an antlerless elk to go to waste and an additional charge of taking an elk without the proper license.

Busbice was sentenced to 90 days in jail (which was suspended), one year of unsupervised probation on Count 1, and six months of probation on Count 2, for a total period of 18 months unsupervised probation. He was assessed a fine of $10,000 for a count of taking a big game animal without a license; $1,000 for waste of a game animal; $80 in court costs; and $12,000 in restitution, for a total fine amount to $23,080 in fines and restitution. His licenses with the Department were revoked for 2017 and 2018.

The Defendant and his counsel articulated significant concern over the potential loss of privileges. This case demonstrates the importance of the revocation of privileges as a deterrent for wildlife violations.

State of Wyoming v. Nathan Strong

Strong poached a record-book mule deer known by the community and photographed by many. Strong tagged the buck with a white-tailed buck license. At the scene of the crime, Strong took photos of

the deer's tail as an alibi to justify the illegal take. The buck was mounted and displayed at a sportsman's show just months after as a "mule deer."

This case resulted in significant public engagement. Strong received a fine of $9,040; 10 days in jail (five served); 50 hours of community service; revocation of all hunting and fishing privileges; and prohibition from purchasing preference point for seven years. This case demonstrates prescribed penalties for the intentional illegal take of trophy wildlife.

State of Wyoming v. Colton Lapp

Upon conviction of several wildlife violations, misdemeanor charges were dropped with three felony charges resulting in fines of $30,000, plus $1,500 in restitution; 18 to 24 months in custody of Wyoming Department of Corrections for placement in the appropriate facility; three counts to be served consecutively; suspended privilege to take any wildlife for the period of 99 years; and forfeiture of Remington Model 700 rifle and Leupold scope to the Wyoming Game & Fish Department. This case demonstrates the usefulness of felony provisions and loss of privileges for wildlife violators.

In Wyoming, leaders continue to evaluate the effectiveness of the punishments for wildlife crimes. We also know that, despite existing laws, incidents of illegal activities occur. Fortunately, our law enforcement officials continue to bring significant wildlife cases to justice, and the public continues to support higher penalties and also call for additional law enforcement staffing. The public also remains one of our most valuable assets in the apprehension of wildlife violators.

International Wildlife Trafficking and the Role of the U.S. Fish & Wildlife Service Office of Law Enforcement

Bryan Landry
U.S. Fish & Wildlife Service
Falls Church, Virginia

Introduction

My name is Bryan Landry. I am a senior special agent with the U.S. Fish & Wildlife Service (USFWS) Office of Law Enforcement (OLE) where I work within the International Operations Unit (IOU) at our headquarters in Falls Church, Virginia, just outside of Washington, DC. Prior to coming to headquarters, I worked as a field agent in several locations throughout the United States, including most recently in Hawaii, the Pacific Islands, Arizona, and Boston/New England. Prior to becoming a special agent, I was a wildlife inspector at the world's busiest airport—Hartsfield-Jackson International in Atlanta, Georgia. My presentation today involves international wildlife trafficking and the role of the United States and the OLE to combat wildlife trafficking.

What Is Wildlife Trafficking and Why Is It Important?

Simply put, wildlife trafficking is the illegal trade in wildlife and wildlife products. A recent report by the United Nations Environmental Program estimates wildlife trafficking as a $7 to $23 billion a year industry.

Regardless of one's position on wildlife conservation, wildlife trafficking has significant global impacts, including the following:

1) Wildlife trafficking is just one component of overall organized criminal activity (money laundering, tax evasion, etc.);
2) Wildlife trafficking affects entire ecosystems (live coral removal from living reefs);
3) Wildlife trafficking drives species extinction (rhinos poached for horn, elephants for ivory);
4) Wildlife trafficking undermines legal harvest (sustainable fishing for paddlefish may be allowed in some states; however, illegal overharvest is changing some state laws to allow *no* harvest);
5) Wildlife trafficking threatens indigenous/native subsistence resource availability (native Alaskan artic subsistence); and
6) Wildlife trafficking impacts sustainable industries (ecotourism, safaris, national parks, etc.).

Wildlife Laws

Unlike many other countries, the U.S. enjoys not one but a suite of wildlife laws that protect wildlife and plants. These laws include the Endangered Species Act, the U.S. Lacey Act, the Convention on the International Trade in Endangered Species (CITES), the Migratory Bird Treaty Act, and the Marine Mammal Protection Act, among others.

U.S. Lacey Act

One important law that the United States implements is the U.S. Lacey Act. In general, the Lacey Act makes it unlawful for any person to import/export/transport/sell/receive/acquire or purchase *any* wildlife or plant (not just protected species) taken/possessed/transported or sold in *violation* of any federal/state/tribal or *foreign* law. The U.S. Lacey Act is unique in the world as it provides a mechanism to enforce violations of state, tribal, or even foreign laws after the wildlife has left its respective jurisdiction.

Lacey Act violations can carry felony provisions and stiff penalties. In this recent case of U.S. v. Bengis Fisheries, a Lacey Act conviction in U.S. court for the illegal import into the United States of lobsters taken in violation of South African law, the judge ordered the seafood companies to pay $22.5 million USD in restitution to the government of South Africa. This case demonstrates how the Lacey Act can have significant impact on the impacted countries as well.

Convention on the International Trade in Endangered Species of Flora and Fauna

The U.S., along with nearly every other nation in the world, is a party to the Convention on the International Trade in Endangered Species of Flora and Fauna, otherwise known as CITES. CITES regulates listed wildlife and plant species through a series of universal standards for international trade in many species, such as crocodilians, bobcats, American ginseng, and corals, while generally prohibiting international commercial trade in other critically endangered and iconic species, such as cheetahs, tigers, sea turtles, elephants, and rhinos, to name a few. CITES is an important tool for countries to work together on the global issue of wildlife trade.

The Office of Law Enforcement

The Office of Law Enforcement (OLE) includes both wildlife inspectors and special agents. Approximately 120 wildlife inspectors stationed at major U.S. ports work side by side with Customs & Border Protection (CBP) to inspect wildlife coming to and from the U.S.

Approximately 240 special agents or criminal investigators are stationed throughout the U.S. and are now at seven U.S. embassies throughout the world. This relatively small law enforcement force is unique in the world and unique within U.S. law enforcement in its focus on wildlife crime.

A quick snapshot of statistics generated by our small force of approximately 360 officers provides that in fiscal year 2016, the OLE generated nearly 10,000 investigations, with prosecutions resulting in nearly $29 million in fines/penalties, 46 cumulative years in prison time, and 387 years of probation. During this same period, our wildlife inspectors *cleared* more than 181,000 wildlife shipments, worth more than $6 billion to the U.S. economy.

International Operations Unit

The International Operations Unit (IOU) currently has seven senior special agent attachés stationed at the following U.S. embassies: Bangkok, Thailand; Beijing, China; Dar es Salaam, Tanzania; Gaborone, Botswana; Libreville, Gabon; Lima, Peru; and Mexico City, Mexico. The area of responsibility for each attaché is regional and covers a large area that requires coordination with numerous embassies and partner organizations. Attachés support U.S.-based wildlife trafficking investigations that have a nexus to the region where the attaché is working; support host government investigations; assist in leveraging U.S. government assets for use in counter wildlife trafficking efforts; and support regional capacity building in key law enforcement and investigative skills. In addition, attachés offer access to OLE resources, such as the USFWS National Fish and Wildlife Forensics Lab and Digital Evidence Recovery and Technical Support Unit (DERTSU).

U.S. Involvement in Global Counter Wildlife Trafficking Efforts

There have been questions in this space surrounding the U.S. presence abroad and U.S. interest in counter wildlife trafficking (CWT) efforts in foreign countries. Graphics from the most recent United Nations Office on Drugs and Crime World Wildlife Crime Report clearly illustrate the reality that the U.S. is a significant source, transit, and consumer of wildlife.

There have also been two significant presidential executive orders (EOs) that have shaped the establishment of the IOU and posting of wildlife law enforcement attachés: President Obama's EO of CWT in 2013 and President Trump's EO in 2017 of combatting transnational organized crime, in which wildlife trafficking is specifically mentioned.

National Fish and Wildlife Forensics Laboratory

The National Fish and Wildlife Forensics Laboratory (Lab), located in Ashland, Oregon, is the world's only full-service crime laboratory devoted exclusively to supporting wildlife law enforcement. Scientists at the Lab identify the species of wildlife parts and products seized as evidence. They link suspect, "victim," and crime scene through the examination and comparison of physical evidence; determine the cause of death of wildlife crime victims; and help analyze crime scenes.

Digital Evidence Recovery and Technical Support Unit

The Digital Evidence Recovery and Technical Support Unit (DERTSU) specializes in highly technical functions related to digital forensics and technical surveillance equipment. In the current climate of combating global wildlife trafficking, transnational organized crime syndicates involved in illegal wildlife trafficking regularly utilize digital technology to carry out their criminal activities. Most wildlife trafficking investigations contain many types of digital evidence, which require special techniques provided by DERTSU for proper handling, examination, and results reporting. Similar to the Lab, DERTSU is the only unit of its kind in the United States and is a leader worldwide in providing highly technical digital forensic and covert surveillance program support.

International Capacity Building

Another important aspect of the attaché work is regional capacity building. Working one-on-one with local authorities, the attaché can assess specific training needs and provide tailored training to suit regional needs. Attachés and USFWS OLE personnel have provided training on identification and handling of evidence, wildlife crime scene processing, interviewing and interrogation, wildlife forensics, developing sources and informants, smuggling and controlled deliveries, and undercover techniques.

International Enforcement Operations

In 2017, the United States participated in a global wildlife enforcement operation, Operation Thunderbird, organized through the auspice of CITES and the International Consortium to Combat Wildlife Crime. The operation involved the participation of CITES law enforcement authorities of more than 60 countries, including, among others, the United States, Canada, Mexico, China, India, Russian Federation, Zambia, Mozambique, South Africa, and the European Union.

The operation—facilitated by the INTERPOL Wildlife Crime Working Group (WCWG), the World Customs Organization, and the CITES Secretariat—provided a snapshot view of wildlife trafficking globally and established a platform for information sharing between CITES and WCWG partner nations to initiate joint investigative efforts to combat transnational wildlife crime (Figure 1). In the United States, the operation was widely considered a great success and initiated increased inspections/operations at multiple U.S. ports, such as Honolulu, New York, Los Angeles, Miami, Newark, New Orleans, Portland, and San Ysidro (Mexico border). The operation also further strengthened cooperation and information sharing with foreign partner nations and with those countries affected by foreign trade with the U.S.

International efforts such as Operation Thunderbird represent a positive example of international collaboration with a message to would-be global wildlife traffickers: The world is working together to combat wildlife crime and there is no safe place to hide.

Conclusion

Wildlife trafficking is a global issue that no single entity or sovereign state can solve alone. We must think globally in our fight to combat wildlife crime and work together on this global issue.

Figure 1. A snapshot view of global wildlife trafficking as identified in Operation Thunderbird.

Global Seizures (*as compiled by INTERPOL*)

- More than 4,770 birds
- More than 100 Wild Cats
- More than 8.2 tons of Ivory
- More than 25 tons various wildlife products
- More than 1,240 Reptiles
- More than 2.17 tons of pangolin scales
- More than 310 animal skins
- More than 58 Tons of Wood/Timber
- More than 37,130 derivatives of wildlife products (*medicines, carvings, parts*)
- More than 14 Tons of Marine Wildlife Products (*shark fin, sea cucumber, etc.)*

'Snapshot' of U.S. Seizures/Interdictions

- **Live CITES Stony Corals, Fish & Rays** – 356 no.
- **Live CITES Tortoises/Reptiles**– 1558 no.
- **Live Birds *(smuggled)*** – 44 no.
- **Dried Sea Cucumbers** – 1,000 kg.
- **Dried CITES Shark Fins *(smuggled)*** – 23,581 kg.
- **Dried Seahorses *(smuggled)*** – 180 no.
- **CITES Nautilus/Sea Turtle/Coral Jewelry** – 201 no.
- **Coral/Sea Turtle/Giant Clam Products** -
- **Hunting Trophies *(leopard, lion, baboon, hippo, caracal, bear, bighorn sheep, etc.)*** – 27 sp. and 44 kg. meat
- **Whale/Giant Clam/Queen Conch Meat** – 24 kg.
- **African Bushmeat (unknown sp)** – 10 kg.
- **Pangolin** – 1 kg bushmeat and 3 leather products (Africa)
- **Elephant Ivory** – 41 no.
- **Parrot & Macaw sp. Part/Product/Feathers** - 778 no.
- **Dried CITES Plant/Orchid TCM** - 41 kg.
- **Dried CITES Wild Am. Ginseng Roots (EXPORT)** – 10 kg.
- **CITES Wildlife TCMs (*Containing Tiger, Rhino, Seahorse, Pangolin, etc.)*** – 596 no.
- **CITES Sturgeon Extract Cosmetic** – 730 no.
- **CITES Sturgeon Caviar** – 5 kg.
- **CITES Reptile Leather Products** – 345 no.

Poaching, Wildlife Trafficking, and North American Wildlife Conservation: Default on the Public Trust

John F. Organ
U.S. Geological Survey
Reston, Virginia

The history of America is tied to pioneers, free of restraints, expanding and, ultimately, taming the frontiers—geographical, social, and political—a theory first advanced by Frederick Jackson Turner in 1893 (1894; see also Billington 1978; Faragher 1999). Historical accounts describe an America abounding with wildlife. Colonial Americans generally were imbued with religious fervor and desperate desire for personal freedoms. Many tenaciously clung to old-world customs and cultural traditions, but emancipated from their European bonds, they found prospect in self-determination and relief from social hierarchy and its elitist restraints on taking game (Organ and McCabe 2018). The notion that prosperity could be gained and the only limits were those that were self-imposed resulted in the fur and game trade becoming the primary economy of the colonies and fostered a sense of righteousness over the taking of game for personal profit (Matthiessen 1964; Smalley 2017).

In most of the original colonies, there were no restrictions upon taking fish and game except for restrictions from property that was purposely fenced for their exclusion (Gabriel 1912; Lund 1980). This freedom was based on *ferae naturae*, a legal doctrine that made wild animals owned by those who captured them, and not by the person on whose property the animals were captured (Organ and Batcheller 2009). This was quite different from the European system, which essentially held a hunting and fishing monopoly for the blue bloods (Manning 1993). For example, England's 1722 Black Act identified deer poaching as the law's primary target and made it a capital crime (Smalley 2017).

Commercial aspects, such as the market and bounties, incentivized colonial hunters, as did gathering food for the table, garnering protection from crop depredations, and escaping from the drudgery of farming (Herman 2001; see also Beverley 1705). In 1624, John Smith (1907) observed, Jamestown planters trained their servants and young to hunt. Little thought was given to checking the take of wild game for subsistence or otherwise, at least until desired species, such as white-tailed deer (*Odocoileus virginianus*) and wild turkey (*Meleagris gallopavo*), were extirpated or nearly so.

Advent of Game Laws

As early as 1630, the general court of Massachusetts colony declared a bounty on wolves (*Canis lupus*) (Shurtleff 1853; see also Young and Goldman 1944; deCalesta 1976). Other colonies followed suit, including Virginia two years later, offering goods and privileges in lieu of money. Elliott (1846) railed against commercial deer hunts for killing the animals that remained. He also saw fault with Americans, generally, for failing to give any protection to wildlife, "seeing any such move as aristocratic and a threat to the 'rights' of the people" (Reiger 1975).

The earliest hunting restrictions were promulgated by local jurisdictions. In 1646, the town of Portsmouth, Rhode Island, closed deer hunting from May 1 to November 1, and called for a violation penalty of five pounds. This ordinance established a pattern of laws adopted by most colonies before 1720 (Trefethen 1975). Following a 1741 law that prohibited killing white-tailed deer between December 31 and August 1, each New Hampshire town was required to appoint two persons to search houses for possession of venison and fresh deer hides. Massachusetts hired wardens, or "reeves," about the same time. Fifty years later, New York passed a law prohibiting the killing of heath hens (*Tympanunchus cupido*) between April 1 and February 5.

By 1800, all of the original 13 colonies had enacted some type of restriction on the taking or use of white-tailed deer, although enforcement of some sort was concomitant only in North Carolina (by 1738) and elsewhere lagged by decades or even centuries. "Blue law" closures to Sunday hunting went

into effect in colonies in the 1700s (11 eastern states remain affected). The first multiyear closure of hunting was for deer in Massachusetts, beginning in 1718.

Much later, large areas of North America were colonized by agricultural people from Europe (Sigler 1956). According to Sigler (1956), these people brought with them a tradition of resentment against fish and game laws, which they considered to be unnecessary anyway since wildlife seemed so abundant.

Laws and Policies Prohibiting Poaching and Wildlife Trade

Trefethen (1975) and Reiger (1975) chronicled the decline of wildlife in the 19th century, due in part to commercial market hunting, as well as water and land uses and governmental tribal policies. These dramatic declines mobilized the sport hunting community and spearheaded the wildlife conservation movement. Grinnell (1894), a preeminent conservation leader, insisted that "public policy demands that the traffic in game should be abolished." Legal initiatives such as the Yellowstone Park Protection Act, the Lacey Act, the Adirondack Deer Law, and the Migratory Bird Treaty Act were key milestones in the conservation movement and represent a benchmark whereby the first step in restoring America's wildlife was elimination of commercial trafficking. The common law base for these laws is the public trust doctrine and the state and provincial codes derived from it (Batcheller et al. 2010). The fundamental principle established in the doctrine, dating back to ancient Roman law and the Magna Carta, is that wildlife cannot be privately owned; rather, they are owned by the government to be held in trust and allocated for the benefit of current and future generations (Organ and Mahoney 2007). Thus, wildlife is a trust resource, with the government as trustee and the public as beneficiaries or shareholders (Organ et al. 2014). This notion of public ownership of wildlife is the keystone of the concept known as the North American Model of Wildlife Conservation, the collection of legal policies and principles that distinguish wildlife conservation in Canada and the United States from other forms worldwide (Geist and Organ 2004; Organ et al. 2012). This concept has seven principles, with wildlife as a public trust the first. Others directly derived from public trust thinking include allocation of wildlife by law, elimination of markets for game, and wildlife should only be killed for legitimate purposes.

Poachers and Poaching

Illegal take of wildlife occurs in many forms—and does not necessarily involve trafficking (Potter, Nurse, and Hall 2016). Muth and Bowe (1997) developed a typology for poaching with 10 motivational categories: 1) commercial gain, 2) household consumption, 3) recreational satisfactions, 4) trophy poaching, 5) thrill killing, 6) protection of self and property, 7) poaching as rebellion, 8) poaching as a traditional right, 9) disagreement with specific regulations, and 10) gamesmanship.

Rytterstedt (2016), in a study of Swedish poachers, describes how they avoid feelings of guilt or shame over their crimes through techniques of neutralization. These techniques are not justifications for criminal behavior but rather mechanisms that enable violations of societal norms or laws through rationalization. Examples include claiming the incident was an accident, blaming it on poverty, and deflecting it on perceived corruption of law enforcement officials. These techniques of neutralization comport well with the motivational typology developed by Muth and Bowe (1997). One can imagine how a suite of motivations and concomitant neutralization techniques can become embedded in a subculture and how an otherwise illegal activity, running underground, if you will, goes largely unchallenged.

Poaching, Wildlife Trafficking, and the Public's Wildlife

Garrett Hardin's (1968) classic paper on the tragedy of the commons is ubiquitous in natural resource conservation education. The classic story of a free-for-all commons with unregulated use degenerating into nothing-for-all is allegorical to North American wildlife in the 19th century. The affirmation of public ownership of wildlife via the public trust doctrine, the advocacy of sport hunters and

others concerned with wildlife, and the eventual establishment of the Wildlife Management Institution resulted in laws and social norms that placed value on wildlife when alive versus wildlife as a commodity when dead (Geist, Mahoney, and Organ 2001). Poaching and trafficking of wildlife has insidious consequences because it places value on wildlife as a commodity (i.e., capital gain) and apparently can fulfill core values of independence and freedom from authority (Muth and Bowe 1997). The latter is ironic because 19th century motivation behind the sport hunting movement was a desire, in part, to perpetuate wildlife so that Americans could hunt under conditions of fair chase as a means to cultivate qualities of self-reliance and independence (Organ et al. 2012). The danger here is that poaching and wildlife trafficking have potentially both economic and intrinsic benefits to its perpetrators.

A key principle of trusteeship is balancing the current benefits against the sustainability of trust resources—i.e., corpus protection (Organ et al. 2014). This requires prudence and risk aversion, among other qualities. Trust administrators (trustees and agents of the trustees), by necessity, must be conservative in allocating uses, whether consumptive or nonconsumptive, for a particular wildlife resource when it is rare, at-risk, or endangered (Smith 2011). The ability of the public (the beneficiaries) to derive benefit from the resource is hindered if portions of the corpus of that trust are squandered uncontrollably. The net result is that a few will gain at the expense of the majority.

Summary

Poaching and wildlife trafficking pose enormous, even catastrophic, consequences to wildlife globally (Potter, Nurse, and Hall 2016; Robinson, Flacke, and Hentschel 2017; Somerville 2016). Indeed, some species could be driven to the verge of extinction, particularly when combined with other landscape stressors, such as habitat loss, that could spark an extinction vortex (Robinson, Flacke, and Hentschel 2017; Fagan and Holmes 2005). Wildlife conservation in the United States is founded on a robust system of laws, policies, and institutions and sustained by a culture that generally values free-ranging wildlife (Duda, Bissell, and Young 1998). Wildlife is a public trust resource, theoretically held in balance by an institution that manages and allocates the dividends of this trust. Poaching and wildlife trafficking have the potential to not only diminish the corpus of the trust but undermine the very foundation of the wildlife conservation institution through a shadow system of unregulated allocation, reinforced economically and culturally, that renders its organic principles hollow.

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Jennifer Allen, Gray Anderson, Taylor Austin, Lianne Ball, Lowell Ballard, Sarah Barlow, Terry Bashore, Jessica Bassi, Michael Bednarski, Scott Belfit, Angelia Binder, Paul Block, Jacqueline Bort, Dana Bradshaw, Laura Busch, Jeffery Butts, Bob Byrne, Christine Cadigan, Earl Campbell, Joseph Campo, Emmett Carawan, Dave Chanda, William Chappell, Dawn Childs, Edwin Christopher, Peter Churchbourne, Andrea Criscione, John Culclasure, Bob Curry, Janet Cushing, Steve Czapka, Joe Daigneau, Jeffrey DeBerry, Alisa Dickson, James Dolan, Sean Donahoe, Kevin Du Bois, Mark Duda, Robert Duncan, Alex Echols, Mark Edwards, Verl Emrick, Bethany Erb, Amy Farak, Todd Fearer, Robin Ferguson, Ben Fulton, Julia Galliher Peebles, Alicia Garcia, Mary Gerloff, Jaime Gormley, Ashley Gramza, Stinger Guala, Rebecca Gwynn, Healy Hamilton, Steve Hanser, Leslie Hartsell, Elsa Haubold, Julie Henning, Edward Herndon, Maria-Richetta Camille Hopkins, David Hoskins, Cara Hotchkin, Doug Howlett, Glenn Hughes, Stephanie Hussey, Kate Hutson, Kelly Ingebritson, David James, Michael Jean, Anne Jewell, Danielle Jones, Michael Jones, Brent Keith, Ashley Kelly, Anne Kinsinger, Cynthia Kolar, Jarrad Kosa, Aneil Kumar, Alison Lanier, Valerie Leone, Gwen Lockhart, Christopher Lotts, John Lowenthal, Laura MacLean, David Mapstone, Brandon Martin, Steven Martin, Thad McDonald, Lawrence McGrogan, Stephanie McManus, David Miko, Aaron Mize, Bryan Moore, Darin Moore, Mary Anne Morrison, Sarah Mott, Brian Moyer, Jene Nissen, Mike Nussman, Thomas Olexa, Collin O'Mara, Hannah O'Neill, John Organ, Ryan Orndorff, John Ouellette, Mamie Parker, Paige Pearson, Chris Petersen, Frank Peterson, Karen Mehall Phillips, Andrew Pitt, Elizabeth Powell, Kelly Proctor, Susan Recce, Kelly Reed, Deanna Rees, Erica Rhoad, Jacqueline Rice, Ken Richkus, Jay Rubinoff, Andrew Satterwhite, Dolores Savignano, Megan Scanlin, John Schmerfeld, Lori Scott, Preston Smith, Sarah Stallings, Skyler Thomas, John Thompson, Benjamin Tuggle, Melina Tye, Joseph Vlcek, Dave Walker, Meegan Wallace, Blake Waller, Kevin Walter, Jeff Walters, Robert Wells, David Whitehurst, Byron Williams, Joshua Winchell, Justine Woodward, Thomas Wray, Michael Wright, Anne Zimmermann

Washington

Mary Anderson, Eric Gardner, Reid Harris, Mike Kuttel Jr., Todd Sanders, Rick Spaulding, Julia Stockton, Shawn Woodard

West Virginia

Clifford Brown, Bettina Fiery, Mary Hughes, Paul Johansen, Christopher O'Bara, Jay Slack, David Smith

Wisconsin

Dan Gonnering, Chandra Harvey, Justine Hasz, Steve Kuennen, Eric Lobner, Robert Lonsinger, Nick MacDonald, Christopher Matzke, Duane Meighan, Sanjay Olson, Kendra Pednault, Katie Richgels, Mike Spors, Christine Thomas, Ollie Torgerson, Mark Witecha

Wyoming

Doug Brimeyer, John Kennedy, Richard King, Larry Kruckenberg, Renny MacKay, Dirk Miller, Robert Model, Brian Nesvik, Alan Osterland, Martin Piorkowski, Jason Ritzert, Scott Smith, Scott Talbott, Karen Tyrell

Other

Kaush Arha, Tessa E. Martin Bashore, Brian Batts, Marie Bundy, Anthony Daly-Crews, Vicki Lee deVos, Sue Downes, Kayte Dunfee, Sarah Fangman, Carol Faulstich, Susan Fulton, Meghan Gilbart, Jen Gray, Julie Grogan-Brown, Carol Hollowed, David Hubbard, Chrissie Jackson, Krista Larson, Virginia Lesser, Alex Maggos, Jane McDonald, Mark Milligan, Julie Moretti, Bill Moritz, Melissa Neely, Victoria Nutt, Johnathan O'Dell, Sammy Powell, Manfred Rieck, Mark Schmidt, Scott Sharpe, Richard Shores, Steve Smits, Eric Songer, Richard Sparks, Kevin Tam, JoAnn Whitson, Beth Williams, Nikki Williams, Meg Wilson, Reiko Yamazaki, Gabriela Zaldumbide