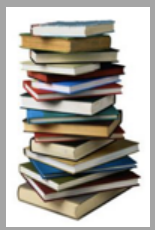
natural capital PROJECT

Newsletter: NatCap Goes To The City

AUGUST 2015

Recommended Reading From The Desk Of Mary Ruckelshaus



War of the Whales by Joshua Horwitz is a fantastic 'small world whodunit story about how a whale scientist (Ken Balcomb from San Juan Island Whale Museum), NOAA Fisheries leaders and Joel Reynolds from NRDC extract the truth about Navy sonar testing and its impacts on dolphins and whales. The story centers around scret sonar testing in The Bahamas, including a navy base on Andros Island where NatCap's new project with IDB is starting.

The Wild and Haunting World of Dolphins by Susan Casey, an excellent story teller who also wrote "The Wave" and "Devil's Teeth," which, like "Dolphins are a great mix of science, inspiring personal stories of people and history. The story of the pod of dolphins off of Catalina Island who save a suicidal woman three miles out to sea is a fantastic story for your kids, grandma, and the person you're stuck with on an elevator. She can teach us a thing or two about how to spin a yarn from geeky stuff.

The Weight of the World
by Elizabeth Kolbert
Another favorite writer and topic: In this New York article, Kolbert talks about the power of a single leader in transforming the world. She profiles Christina Figueres, who leads the UN's Framework Convention on Climate Change, and who is preparing for the next COP (Conference of the Parties) coming up in Paris this fall. Figueres is 5 feet tall, 59 years old, and is passionate and personal in how she engages world leaders in

NatCap Goes To The City

A Q&A WITH BONNIE KEELER

You've been working on developing The Natural Capital Project's urban program. What's the vision for this program?

Bonnie Keeler, Lead Scientist at Natural Capital Project

Our vision is to take the same science-based approach NatCap has developed for agricultural, forested, and coastal landscapes and use this knowledge to inform conservation and development decisions in urban areas. Cities are where the connections between people and nature have real and immediate consequences for health and wellbeing, so there's a great opportunity for NatCap to expand our impact.

We also see two parallel paths for our cities program. First, we have a set of well-developed tools and proven approaches for services like water security and coastal protection. We hope to scale these approaches through a global network of city leaders while identifying the places where nature-based solutions are most likely to improve resiliency and reduce environmental risks. Second, we envision a new suite of tools that will capture and integrate benefits for urban services such as mental health and recreation.

For a long time, conservation has focused on remote and rural areas. Where is this urgency in paying attention to cities coming from?

Over half of the global population now lives in cities and that percentage will only increase in the decades ahead. Urban nature — whether it is yards, parks, or street trees — may be most people's only contact with the natural world. Of course, those remote and rural areas are also important to urban residents. These rural areas provide valuable services like food and clean water. We need to highlight the links between conservation outside of cities in areas where services are originating as well as nature within cities.

Are there policy or strategic advantages of working in cities?

Certainly. Cities are laboratories for experimentation and centers of innovation. Cities can be nimble and responsive — city leaders and planners don't necessarily need to wait for state or federal government regulation or decision-making in order to act. New York City is setting up task forces to explore nature-based solutions to the urban heat island effect. Leaders in Durban, South Africa are advocating for natural capital

a ‘bottom up’ effort to enlist support for reducing carbon emissions. If she can do it, why can’t we?

NatCap Senior Hydrology Adviser Drew Guswa To Become Smith’s Engineering Program Chair In 2016

A civil and environmental engineer, Drew Guswa is on sabbatical at Stanford, and among many projects, he is helping NatCap scientists analyze how changes to the landscape affect seasonal water flow, also known as "the sponge effect." He has already transformed the way we incorporate hydrological principles into our models. Guswa also features prominently in the current issue of Smith College's Quarterly Alumnae magazine for his role in building their engineering program, bringing women into a field that's 86% male. Guswa also keeps a blog, where he uses storytelling to show how the science he does is relevant to his audience. A recent entry: "The real story of the Panama Canal is one of hydrology. 52 million gallons of water are required for each ship to make the trip through the canal. That's 15% more water than Smith College uses in a year."

approaches as a means to pursue more sustainable urbanization. Residents of cities also have power as advocates and consumers. The collective behavior of urban residents and leaders can have consequences for conservation far beyond the boundaries of the city.

You're based in the Twin Cities — a location I don't tend to associate with a lot of urban problems. Why start there?

The Twin Cities (St. Paul and Minneapolis) have one of the top-ranked parks systems in the U.S. Minnesotans place a lot of value on green space and water quality. There are positive examples we can learn from here that can hopefully be applied to other urban areas. But it isn't all positive. The Twin Cities struggles with equity issues, which means projects here need to consider how inequities play out across the metropolitan area.

In terms of scientific expertise, the University of Minnesota is home to an incredible wealth of researchers representing many different disciplines who are all working on issues and challenges in the urban space. The Institute on the Environment provided seed funding to launch and expand upon this network of urban researchers at Minnesota, and we plan on including other researchers and institutions moving forward.

While the Minnesota team is taking the lead on scoping Urban-InVEST, the Urban-InVEST program at NatCap will engage the collective talent and expertise across NatCap to build a collaborative network representing many academic and non-academic partners in the U.S and internationally. For example, we've already developed new partnerships with the University of Washington, the University of Vermont, the New School, and UCLA.

What is the relationship between sustainability and equity in cities?

We cannot tackle sustainability without considering equity. Environmental sustainability is often associated with the concerns of communities of privilege — think electric cars & solar panels. However, the environment affects all urban residents, and the negative impacts often fall disproportionately on the poor and vulnerable. I'm motivated to work directly with underserved communities to help visualize and advocate for the environment that they want, recognizing that different groups will have different preferences for urban nature and the services nature provides.

How do trailer park communities figure into your scoping?

A lot of the planning that happens in cities is very top down. There are city-wide initiatives for green infrastructure developed and implemented at the city or regional scale. I'm interested in exploring the role of natural capital models and tools in more of a bottom up approach to urban design and planning. Would information on the benefits of trees or other green spaces at the neighborhood-scale be useful to residents in advocating for the futures that they want for their communities?

The idea to pilot this bottom-up approach in trailer parks came from colleagues working in affordable housing. Most people are surprised to learn manufactured housing is largest source of unsubsidized affordable housing in the nation. And trailer parks are

more likely to be located in environmentally vulnerable locations in the cities — near highways with greater exposure to pollution or in flood prone areas on the outskirts of urban centers.

I'm interested to learn how these communities might benefit from information about the role of nature in reducing air pollution, reducing infrastructure expenses, improving access to recreational and cultural amenities, improving mental health, or providing shade for homes that often don't have air conditioning.

Does NatCap's approach include a direct interaction with those communities? How do they get involved?

Our hope is to work with existing networks that serve these communities. We're still in the early stages, so stay tuned for more information as partnerships and plans develop.

Which urban ecosystem services are rising to the top of your scoping efforts?

I'm excited about the work on the mental health benefits of nature developed by Greg Bratman and Gretchen Daily at Stanford University. Their work has found clear mood and cognitive benefits for people who experience urban nature.

We have a small grant to convene public health officials, designers, planners and other city leaders interested in incorporating information on mental health into their decisions about the design and planning of urban parks and green spaces. Our initial meetings revealed a huge demand for tools and guidance from a variety of stakeholders. We're excited to explore questions such as "What would a city designed for mental health look like?"" or "What is the appropriate dose of urban nature?""

Another opportunity I'm excited about is in Africa — we are hearing from cities like Addis Ababa and Durban that are trying to run our regular InVEST tools to evaluate their alternative development plans. The current InVEST tools are pretty limited in the quality of information they can provide for services relevant to the residents of these cities, especially for things like heat stress and disease, exposure to polluted air and water, and cultural benefits. The fact that these cities are using our tools is great, but I'd like to be able to provide them with a better toolkit that is more appropriate for their needs.

You started your academic career as a biogeochemist. How did you wind up working with NatCap?

I wanted to be a scientist, but I also wanted to make a difference and do work that mattered to people, not just other scientists. However, as a graduate student, I started to grow frustrated with how hard it seemed to do that kind of science. There was no clear connection to real people or problems. I did not see a path within academia that was aligned with my goals and passions. I left academia after my masters and began searching for careers with more direct relevance to decisions, policies, and people. After a few years exploring urban planning, landscape architecture, and eventually a nursing degree, I ended up being drawn back to science through my introduction to the Natural Capital Project.

So does this urban conservation work you're doing now allow you to integrate those former passions?

I'm excited to return to those earlier interests in urban planning, landscape architecture, and public health. Our urban work has the potential to be really impactful. The intersection of science and people and decisions is where I am most inspired to work, and these connections are particularly strong in cities.

Bonnie Keeler leads the Minnesota-based NatCap team, where she is a staff scientist at the Institute on the Environment at the University of Minnesota.

Peter Kareiva Goes To The City

KAREIVA TO LEAD UCLA'S INSTITUTE ON THE ENVIRONMENT

NatCap co-founder Peter Kareiva stepped down from his full-time position as chief scientist at The Nature Conservancy to lead the University of California — Los Angeles' Institute on the Environment and Sustainability. Though he will continue to play a leadership role at TNC as a Senior Science Adviser, the news sparked a shower of retrospectives on Kareiva's contributions to environmental science, including being credited with helping to change the trajectory of conservation, putting humanity in center focus.

Peter Kareiva, a co-founder of Natural Capital Project. Photo credit: poptech/Flickr via a Creative Commons license

"Peter consistently made conservation about people," said Sanjayan, executive vice president and senior scientist at Conservation International, "and with that simple innovation, he gave us a new paradigm by which we could protect the places and creatures we love. Everything from water funds to community-based fisheries to Development by Design is rooted in and supported by this simple premise: that people need nature, and saving natural capital is an investment in our future."

Kareiva will continue to guide NatCap from his new urban hub, and maintains his role as a member of our Governing Committee. He outlines some of his vision for this new endeavor in an interview with the LA Times. "We probably know enough biology to solve most of the problems," Kareiva said. "It's not biology that's eluding us, it's social science, economics, psychology, human behavior, how to reach people."

"People's values are at the forefront of conservation psychology. I think we should start with what I call the endgame: What do we want the world to look like in 2050? Have that constrained by real information: There are going to be 9 billion people in the world. You have to work with that. And there's going to be climate change, and that's part of your palette. You paint the picture of what you want the world to be like in 2050. Then you say, "What are the ways of getting there?"

With New Research, Can Big Agriculture Leave Its Food Safety Salad Days Behind

New research by NatureNet fellow Daniel Karp and collaborators shows that a massive effort to cut trees and clear shrubs from California farms did not have the intended effect of making food safer for people, but may have even made contamination more likely.

After a particularly virulent strain of*Escherichia coli* killed three people in 2006, and put nearly 200 others in the hospital, including 30 with kidney failure, investigators traced the bacteria back to lettuce grown on the California Central Coast, an area known as the nation's "salad bowl," producing two out of 3 of all salad vegetables consumed in the U.S.

It was known that cow dung can harbor the bacteria. Since the Central Coast is a patchwork of ranches and vegetable farms a perception emerged that wildlife were the culprits, spreading the pathogen from ranchlands to crops. Acting without data, food retailers, packers and buyers requested that farmers try to eliminate feral pigs, birds, foxes, rodents and other animals that live on farm peripheries. Farmers complied by setting poison traps, erecting fences, taking out trees and shrubs, and dumping chemicals into reservoirs.

Karp's study, published in the *Proceedings of the National Academy of Sciences* shows that not only did this policy fail to reduce the presence of pathogens, but farms that removed the most vegetation actually showed higher levels of contamination.

Karp is a postdoc at the University of California-Berkeley, advised by Claire Kremen, and a recipient of a NatureNet fellowship, a program sponsored by TNC to foster research about how to meet "unprecedented demands for food, water and energy — and meeting these demands without exacerbating climate change and degrading natural systems."

Conservation has embraced the idea that protecting nature is beneficial to people, but Karp wanted to use his fellowship to look at the alternative. "I was interested in looking at trade offs, situations where it's not this potential win-win," said Karp, "where maybe it is that nature is causing a cost on society."

But it turned out that having wild plants around farms made the food supply safer.

"We're all well-versed in the fact that habitat can filter out nutrients in the water, and that may be what's going on here," Karp said.

The paper included farming strategies that are more likely to reduce the risks of food poisoning including: installing fencing upstream from cattle and wildlife; attract livestock away from upstream waterways with water troughs and feed; expose compost heaps to high temperatures through regular turning to enhance soil fertility without compromising food safety; and maintain diverse wildlife communities with fewer competent disease hosts.

Comanaging fresh produce for nature conservation and food safety
Karp, Daniel S.; Sasha Gennet; Christopher Kilonzo; Melissa Partyka; Nicolas Chaumont; Edward R. Atwill; Claire Kremen.
PNAS. August 10, 2015. doi:10.1073/pnas.1508435112

OTHER PRESS AND PUBLICATIONS:

Who loses? Tracking ecosystem service redistribution from road development and mitigation in the Peruvian Amazon
Mandle, Lisa; Heather Tallis; Leonardo Sotomayor; Adrian L. Vogl.
Front Ecol Environ. August 2015, Vol.13(6), pp 309-315. doi:10.1890/140337

The deforestation created by a proposed road project linking two cities in Peru and Brazil would harm water quality for nearby streams and rivers - an impact that could be compensated for through mitigation activities such as planting trees. But a new study looks for the first time at whether the benefits of mitigation (i.e. cleaner water) would actually reach the people most impacted by the proposed project.

"It doesn't seem like it's possible to completely offset the ecosystem service losses that would be expected from this particular road project for all people in the area just through restoration or protection of natural ecosystems," said lead author Lisa Mandle. "By accounting for which parts of the landscape are providing benefits to which people, with the same amount of area used as mitigation, you can get a lot closer to off-setting those losses than would be possible just by using total area and ecosystem function, which is how most permitting mitigation programs currently work."

Mitigation for one & all: An integrated framework for mitigation of development impacts on biodiversity and ecosystem services

Tallis, Heather; Christina M. Kennedy; Mary Ruckelshaus; Joshua Goldstein; Joseph M. Kiesecker.
Environmental Impact Assessment Review. November 2015, Vol. 55, pp 21-34. doi: 10.1016/j.eiar.2015.06.005

Towards integrated social-ecological sustainability indicators: Exploring the contribution and gaps in existing global data

Selomane, Odirilwe; Belinda Reyers; Reinette Biggs; Heather Tallis; Stephen Polasky.
Ecological Economics. October 2015, Vol. 118, pp 140-146. doi:10.1016/j.ecolecon.2015.07.024

Forage species in predator diets: synthesis of data from the California Current

Szoboszlai, Amber I.; Julie A. Thayer; Spencer A. Wood; William J. Sydeman; Laura E Koehn.
Ecological Informatics. September 2015, Vol. 29, pp 45-56. doi:10.1016/j.ecoinf.2015.07.003

Pollinator Power: Nutrition Security Benefits of an Ecosystem Service

by Wendee Nicole, Environmental Health Perspectives, August 2015

Ecological Society of America Showcases Notable Papers

by Kristen Weiss and Sara Worden, Stanford Woods Institute for the Environment, August 12, 2015

Who loses? Tracking ecosystem service redistribution from road development and mitigation in the Peruvian Amazon

Mandle, Lisa; Heather Tallis; Leonardo Sotomayor; Adrian L. Vogl.
Front Ecol Environ. August 2015, Vol.13(6), pp 309-315. doi:10.1890/140337

Researchers find walking in nature provides mental health benefits

by Alina Abidi, The Stanford Daily, July 26, 2015

Natural Capital in Decisions: From Lagoons to Coastlines to Entire Countries

by Emily McKenzie, WWF Science Driven Blog, July 21, 2015

Microsoft and The Natural Capital Project join forces to transform the way we evaluate the services that nature provides

by Rob Bernard, Microsoft on the Issues, July 9, 2015

Best Practices for Integrating Ecosystem Services into Federal Decision Making

Olander, L.; R.J. Johnston; H. Tallis; J Kagan; L. Maquire; J. Boyd, S. Polasky; L. Wainger.
Technical Report. 2015. doi:10.13016/M2CH07

A Better Road to Dawei: Protecting Wildlife, Sustaining Nature, Benefiting People

Helsingen, Hanna; Sai Nay Won Myint; Nirmal Bhagabati; Adam Dixon; Nasser Olwero; Ashley Scott Kelly; Dorothy Tang. *WWF Myanmar. June 2015.*