THE FUTURE OF CONSERVATION
CONSERVATION 1.0 V. CONSERVATION 2.0: A TAXONOMY

Jonathan Schechter and Edmund Russell [1]

Background

Yellowstone National Park, the world's first national park, was founded in 1872.

According to the National Park Service Organic Act of 1916, the purpose of Yellowstone and other national parks is "... to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." Thus, the creation of Yellowstone marked not just the founding of the world's first national park, but also the world's first major conservation effort.

The concept of "conservation" was conceived in the first half of the 19th century. While the term has come to mean many things, the essence of conservation is setting aside land and preserving it in a more-or-less "original" state. This was Congress's intention for Yellowstone and, as a result, Yellowstone National Park and the surrounding region can fairly be considered the cradle of conservation as currently practiced worldwide; call this "Conservation 1.0."

In the 1980s – well over a century after Yellowstone's founding – the concept of a Greater Yellowstone Ecosystem (GYE) was proposed and took hold. As currently defined, the GYE consists of roughly 26.7 million acres in Idaho, Montana, and Wyoming, roughly 8 percent of which are Yellowstone National Park itself. These lands are owned by federal and state governments as well as private interests; according to a 2002 paper by Noss, et. al., 64 percent of the GYE is in public ownership, and 36 percent of the GYE is privately owned. Of the roughly 9.6 million privately owned acres, The Nature Conservancy has identified roughly 2 million acres as being both undeveloped and having high conservation value.

While reasonable people can disagree over how effectively public land status and conservation easements preserve land, from a Conservation 1.0 perspective, the basic contours of the GYE have been decided: for roughly 93 percent of the GYE, it is clear both who will own the land and how it will be used. Are there still important battles to be fought over particular pieces of land? Clearly. Is it still important to vigilantly watch over whether lands set aside for conservation are being managed to that end? Absolutely. But for the GYE as a whole, the fundamental big-picture issues of land ownership and use – Conservation 1.0 – have been settled. Perhaps more important, given the GYE's rapid population growth, many of the remaining issues are likely be decided in the next decade or so.

This reality raises a simple question: Now what? When land ownership and uses have been determined, what does the future of conservation look like, whether in the GYE or elsewhere? To begin to explore this question, in May 2008, two Jackson, WY-based non-profits – the Charture Institute and the Northern Rockies Conservation Cooperative (NRCC) – hosted a conference entitled *Conservation 2.0 – Conservation in Greater Yellowstone: Past, Present, and Future. "Conservation 2.0"* built upon The Greater Yellowstone Conservation Organization Directory (2007), a book published by the two organizations which inventoried some 220 non-profit and government conservation organizations working in the GYE.

Following *"Conservation 2.0"*, Jonathan Schechter, Executive Director of the Charture Institute, and Edmund

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Russell, Associate Professor of Science, Technology, and Society at the University of Virginia, developed a taxonomy comparing the fundamental differences between Conservation 1.0 as practiced and Conservation 2.0 as it might come to pass. This taxonomy is presented in Table 1; the remainder of this paper describes each of the taxonomy's two organizing principles, three topical categories, and 19 specific topics.

In the authors' opinion, the principles of Conservation 2.0 outlined in this taxonomy summarize and reflect the best current understanding of how ecosystems and human systems work and inter-relate to one another, and how ecosystems can be managed and conserved to meet a long-term measure of success: viable and interconnected populations of native species able to successfully evolve over time. It is hoped that by describing this taxonomy, it will help those active in conservation – regardless of how or where – to judge their efforts against a larger, common ideal.

Table 1
THE FUTURE OF CONSERVATION
CONSERVATION 1.0 V. 2.0: A TAXONOMY
Schechter/Russell – May 2008

	Conservation 1.0	**Conservation 2.0**
ORGANIZING PRINCIPLES	Discrete	Connected
	Fixed	Changing
TOPICS		
NATURAL SCIENCE-RELATED		
1. Boundaries	Fixed	Permeable
2a. Science	Certainty	Probability
2b. Science	Ecology	Ecology + Evolution
3. View of Nature	Fixed	Changing
4. Ecosystem Connectors	Non-human	Human
5. Management Focus	Species	Systems (habitats)
SOCIAL SCIENCE-RELATED		
6. People and Nature	Separate (other)	Incorporated (us)
7. Honored Landscape Types	Minimally Settled	All
8. Epistemology	Leisure	Leisure + Livelihood
9. Decision-making	Hierarchical/elitist	Democratic w/in Shared Goals
10a. Conservation Advocates – Class	Middle- & Upper-class	All Economic Strata
10b. Conservation Advocates – Race	Caucasian	All Races/Ethnicities
10c. Conservation Advocates – Nationality	American	All
11. Temporal	In time	Through time
MANAGEMENT-RELATED		
12. Land Owners	Public	Public + Private
13. Organizations	Government	Govt. + NGOs + Business
14. Tools	Land Ownership	Behavior Change
15. Working Style	Solo	Collaboration
16. Efficacy Measure	Acreage	Native Species: Viability + Evolution
17. View of Land Use	Differentiation for human uses	Differentiation for natural processes

Organizing Principle I: Discrete v. Connected

Conservation 1.0 viewed the various components of conservation in isolation; Conservation 2.0 will view all aspects of conservation as connected with each other, whether physically, through systems, or temporally.

For example, Yellowstone National Park is a distinct, discrete entity, whose boundaries are defined by lines drawn on a map. Some of these lines follow natural features; others are more arbitrary. As with all national parks, the goal of creating Yellowstone was to "... to conserve the scenery and the natural and historic objects and the wildlife therein...", with no regard for things outside those boundaries. A similar approach has been taken to creating and managing all subsequent "preserves," be they national parks, forests, monuments, or other types of public land.

In the 136 years since Yellowstone's founding, natural and social scientists have come to appreciate that, in their behavior, species – whether human or non-human – pay little attention to such lines. Instead, different species' habitats range over different parcels often owned and managed by different entities with different goals. In its focus on protecting land, Conservation 1.0 did not appreciate this connectivity; Conservation 2.0 does.

In a larger context, Conservation 1.0 also failed to recognize the connectivity between different species, in particular how the lifecycle and well-being of any one species is linked not just to the land it occupies, but the many other species on that land, each of which has its own distinctive habitat and connections. Recognizing and addressing this larger web of interconnectiveness is part-and-parcel of Conservation 2.0

Organizing Principle II: Fixed v. Changing

Not only does Conservation 1.0 focus on parcels of land with fixed boundaries; it views conservation as essentially fixing a landscape or species in time. In contrast, Conservation 2.0 focuses on how ecosystems change.

For example, Yellowstone National Park was founded in 1872. 13 years earlier, Charles Darwin had published *The Origin of Species,* the book which first popularized the concept that species evolve over time.

In fixing boundaries for Yellowstone and subsequent public lands, Congress did not appreciate that natural processes do not lend themselves to clear spatial demarcations. In a similar spirit, the management philosophy suggested by the Organic Act did not take into account the fact that species change and evolve over time, instead implicitly assuming that the landscape and animals which define a park or forest at its founding would continue to be the landscape and animals defining that land in perpetuity. Recognizing that change and evolution lie at the heart of natural processes will be fundamental to Conservation 2.0.

Natural science-related topics

Topic 1 – Boundaries: Fixed v. Permeable

Conservation 1.0 sees fixed boundaries of land, between species, and between ecosystems. Conservation 2.0 recognizes that these boundaries – whether between parcels of land or natural systems – are constantly in flux, subject to change both temporary and permanent, both short- and long-term.

Topic 2 – Science
(a) Certainty v. Probability
(b) Ecology v. Ecology + Evolution

Arguably, mathematics and engineering form the popular conception of science; that is, in the popular mind, science produces precise, certain answers to questions it studies. This reality plays out in a number of fields associated with Conservation 1.0 issues (e.g. the exactness of land boundaries). It also helps shape the conventional wisdom regarding issues such as the health of a species (e.g. since elk can be counted, and since there are a large number of elk in an area, the elk population must be healthy).

Put another way, the thinking informing Conservation 1.0's view of ecological science is akin to the thinking informing the popular conception of Newtonian physics: a science which is not only precise, but involves objects and phenomena people can detect with their own senses. In contrast, the Conservation 2.0 approach is grounded in the fact that, to biologists, there are few absolute truths, but instead only best estimates based on currently-available data and understanding. Further, because both data and understanding are subject to change, so too is ecological science.

In that sense, Conservation 2.0's approach to science is akin to quantum physics, where fundamental science supports basic principles about objects which exist even if they cannot be readily detected by human senses, or easily understood based on daily experience. Like quantum physics, ecology deals in probabilities rather than certainties, a reality which creates large problems for political and other systems ultimately subject to binary yes-no decisions.

Similarly, while Conservation 1.0 is infused with the spirit of ecology (i.e. the recognition that systems needed to be intact in order to function), Conservation 1.0 perspectives rarely take into account the fact that species in a given parcel of land had evolved to where they were by the time a parcel was conserved, and will continue to evolve in response to evolutionary pressures coming to bear following the parcel's conservation. Conservation 2.0 will not only take into account the ecological perspective of Conservation 1.0, but add to it the evolutionary perspective of on-going change.

Topic 3 – View of Nature: Fixed v. Changing

Because Conservation 1.0 has focused on preserving land and the species living on that land, it has taken a fixed view of nature: future generations will continue to enjoy the qualities extant on a property when that property was preserved.

In contrast to Conservation 1.0 perspective that conserved land and species will remain forever constant, Conservation 2.0 takes into account the reality of evolution, and seek not just to conserve land and species, but the evolutionary processes that connect them through time.

Topic 4 – Ecosystem Connectors: Non-human v. Human

When Yellowstone was founded, America's population was roughly 40 million; the world's population was roughly 1.2 billion. Today, America's population is nearly 8 times greater; the world's around 5 times greater.

In 1872, foot, horse, and sailboat were the primary means of transport; the golden spike had been driven at Promontory Point Utah just three years earlier, and steam-powered oceanic crossings were just beginning to become fixtures in world commerce.

From a Conservation 1.0 perspective, parcels of land were primarily connected by non-human processes, such as animal movement, water flows, wind, and the like. Conservation 2.0 recognizes that human processes – particularly their rapid movement between regions and continents – have become significant factors in altering the ecology of the entire planet.

(Perhaps the most vivid example of this is global warming, which affects every portion of the world without regard to population or visitation.)

Topic 5 – Management Focus – Species v. Systems (habitats)

In the United States, one of the landmark pieces of environmental legislation was the Endangered Species Act of 1973. As the name suggests, the focus of the act was on individual species, rather than on species within the context of larger systems. Conservation 2.0 recognizes this context of species within habitats within systems within evolutionary processes.

Social science-related topics

Topic 6 – People and Nature: Separate (other) v. Incorporated (us)

One hallmark of the founding of national parks has been the removal of people – both indigenous and settlers – permanently or seasonally living within their boundaries, highlighting the sense of separation between humans and the natural world that marks Conservation 1.0. Conservation 2.0 recognizes that humans are one of the many components shaping and using the natural world.

Topic 7– Honored Landscape Types: Minimally Settled v. All

Conservation 1.0 creates a clear distinction between minimally-to-non-settled landscapes and more intensively settled ones (e.g. urban areas), revering the former and disdaining the latter. Conservation 2.0 recognizes the connectivity between all landscape types (e.g. intensively-farmed areas produce food for those living in minimally-settled landscapes; high population concentrations make it easier for less settlement in wild areas), and honors each.

Topic 8– Epistemology – Leisure v. Leisure + Livelihood

As they have developed, national parks disallow essentially all human activities except leisure; national forests are less exclusive, but still emphasize leisure activities. This has shaped how people view wild lands, encouraging a sense that something not fully integrated into all aspects of human life. From a Conservation 2.0 perspective, wild lands are integral to all aspects of life, not just leisure.

Topic 9 – Decision-making – Hierarchical/elitist v. Democratic w/in Shared Goals

The creation and management of public lands has tended to the result of top-down efforts by a small handful of people. Conservation 2.0 will encourage broad democratic participation in decisions made regarding wild lands, but look to have those democratic processes occur within the context of larger shared goals for the conservation of those lands.

Topic 10 – Conservation Advocates
(a) – Class: Middle- & Upper-class v. All Economic Strata
(b) – Race: Caucasian v. All Races/Ethnicities
(c) – Nationality: American v. All

As a rule of thumb, since the founding of Yellowstone, conservation advocates have tended to be white, middle-to-upper class Americans. Conservation 2.0 will look to involve all economic strata, ethnicities, and nationalities

actively involved in adopting and advocating for fundamental conservation principles.

Topic 11 – Temporal

Conservation 1.0 views conserving nature as maintaining a landscape and wildlife at a particular point in time; Conservation 2.0 views conserving nature as maintaining natural wild processes through time.

Management-related topics

Topic 12 – Land Owners: Public v. Public + Private

Conservation 1.0 involves public agencies buying and managing land. Conservation 2.0 involves those public agencies plus private landowners of parcels ecologically connected to public lands.

Topic 13 – Organizations: Government v. Govt. + NGOs + Business

Conservation 1.0 involves public lands managed by public agencies. Conservation 2.0 complements those efforts through collaborations with non-profits and businesses, all sharing similar goals.

Topic 14 – Tools: Land Ownership v. Behavior Change

Conservation 1.0 believed that simply controlling ownership and use of land was sufficient to ensure its conservation. Conservation 2.0 recognizes that human behavior – both while on public lands and, more critically, in every other aspect of life – has profound effects on all natural systems.

Topic 15 – Working Style: Solo v. Collaboration

Since the founding of Yellowstone, most conservation activity has been undertaken by individuals or organizations working by themselves, or at best in tactical alliances with others aimed toward accomplishing a specific goal. Conservation 2.0 will involve groupings of organizations pro-actively collaborating to achieve larger shared visions.

Topic 16 – Efficacy Measure: Acreage v. Native Species: Viability + Evolution

As its rough measure of success, Conservation 1.0 has used acres of land stripped of most, if not all, human use (save recreation). Conservation 2.0 will look to conserve not just land, but the native species and evolutionary processes occurring on that land.

Topic 17 – View of Land Use: Differentiation for Human Uses v. Differentiation for Natural Processes

Conservation 1.0 arose in reaction to an undifferentiated view of land use; i.e. all land was suitable for all activities at all times. In reaction, Conservation 1.0 sought to differentiate land types by setting aside certain parcels of land and limiting the human uses which could occur on them.

Conservation 2.0 will extend this philosophy by recognizing that, in order to achieve its goals of viability plus evolution, significant amounts and types of land must be set aside solely to allow the on-going occurrence of natural processes, without regard to human uses. By extension, other lands will be clearly designated for human purposes, with their particular use(s) also clearly defined.