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The Fictional Ecosystem and the Pseudo-science of Ecosystem Management

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LAND USE CONTROL has long been the goal of the statist element in our society. Zoning was the first major attempt at land use control. Wetland regulation and the Endangered Species Act have extended some control, but nothing has yet brought about a general policy of land use control. Ecosystem management is an attempt to achieve that end.

The fictional ecosystem

In *The Use and Abuse of Vegetational Concepts and Terms*, A. G. Tansley coined the term "ecosystem." Tansley rejected the "conception of the biotic community" and application of the "terms 'organism' or 'complex organism'" to vegetation. "Though the organism may claim our primary interest, when we are trying to think fundamentally we cannot separate them from their special environment, with which they form one physical system. It is the systems so formed which, from the point of view of the ecologist, are the basic units of nature on the face of the earth. ... These *ecosystems*, as we may call them, are of the most various kinds and sizes... which range from the universe as a whole down to the atom" 1/

Tansley further writes “[e]cosystems are extremely vulnerable, both on account of their own unstable components and because they are very liable to invasion by the components of other systems. ... This relative instability of the ecosystem, due to the imperfections of its equilibrium, is of all degrees of magnitude. ... Many systems (represented by vegetative climaxes) which appear to be stable during the period for which they have been under accurate observation may in reality have been slowly changing all the time, because the changes effected have been too slight to be noticed by observers.” 2/

Lackey confirms writing “[t]here is no ‘natural’ state in nature; it is a relative concept. The only thing natural is change, some-times somewhat predictable, oftentimes random, or at least unpredictable. It would be nice if it were otherwise, but it is not.” 3/

The ecosystem may be the basic unit of nature to the ecologist, that is – man, but it is not the basic unit to nature. Its proponents confirm that it is a man-made construct.

We are told in *Creating a Forestry for the 21st Century: The Science of Ecosystem Management* that “ecosystems, in contrast to forest stands, typically have been more conceptual than real physical entities.” 4/

The Report of the Ecological Society of America Committee on the Scientific Basis for Ecosystem Management tells us “[n]ature has not provided us with a natural system of ecosystem classification or rigid guidelines for boundary demarcation. Ecological systems vary continuously along complex gradients in space and are constantly changing through time.” 5/

“People designate ecosystem boundaries to address specific problems, and therefore an ecosystem can be as small as the surface of a leaf or as large as the entire planet and beyond.” 6/

“Defining ecosystem boundaries in a dynamic world is at best an inexact art,” says the U.S. Forest Service (USFS) in its 1995 publication, *Integrating Social Science and Ecosystem Management: A National Challenge*.

“Among ecologists willing to draw *any* lines between ecosystems, no two are likely to draw the same ones. Even if two agree, they would recognize the artificiality of their effort...” 7/

Lugo writes “Ecosystems lack predetermined boundaries. Its spatial and temporal boundaries are arbitrary. ... Once anybody identifies the artificial boundaries of a particular ecosystem, it is possible to refer to that ecosystem as if it had spatial and temporal limits.” 8/

“Setting ecosystem boundaries involves dividing the landscape where the structures exhibit a consistent or significant degree of change when compared with adjacent areas. ... Historically, the ecosystem has been defined as a small homogeneous area or site, such as a stand of trees or a meadow. ... There is disagreement on how many ecosystems to delineate and what specific criteria to use to separate one system from another. Another problem with setting boundaries is that most natural components of an ecosystem, which might be used in defining it, vary along a continuum. The boundaries, therefore, must often be defined as a zone of transition and may be arbitrary or indistinct.” 9/

Dr. Kim D. Coder writes “Intellectually, the **nebulous boundaries** [my emphasis] that delineate a set of biological units and associated resources, which **seem** [my emphasis] to have structural and functional characteristics as well as some level of interactions, can be summarized in the term ‘ecosystem.’ ... In many ways, the term ‘ecosystem’ has become jargon in our society, as wholesale use and misuse of the term blurs accurate and precise definition. It is the psychological concept, in both a **mythical** [my emphasis] and general form, that remains with most people and is tied with natural areas, with the connections between living things, and with the environment.” 10/

From Tansley, Lugo, Coder, et al. we learn ecosystems are artificial, open, indeterminate, vulnerable, unstable, conceptual, inexact, nebulous; a mythical concept. Yet we are to accept the ecosystem as the basic unit of nature. The conclusion defies logic and reality.

The nebulous nature of the ecosystem, an open door for corruption

The nebulous nature of the ecosystem has not deterred bureaucrats, statist academics, and green advocacy groups (GAGs -- The Nature Conservancy, Sierra Club, Audubon, *et al.*) from pushing it as the basic management unit in nature.

Christensen defends the nebulous nature. “The usefulness of the ecosystem concept to management is often criticized because of the absence of a rigid operational definition, but this is precisely its great virtue. The concept recognizes that the goods

and services depend on the processes and that the jurisdictional or ownership boundaries we inscribe on the land often have little relationship to such processes. At the very least, this concept helps identify the patterns of land use that are likely to lead to conflicts and the stakeholders who must be involved in the resolution of these conflicts. In an ideal world, the ecosystem concept could also provide a framework for defining domains of land use planning and management." 11/ It can be whatever the designer wants.

Christensen further writes "Sustainable land use and land management would be greatly simplified if the spatial scales and borders of ownership and management jurisdictions were congruent with the behavior of processes central to the sustained functioning of ecosystems. This is rarely the case for any particular ecological process, and given the variation in spatial domain among processes, a perfect fit for all processes simultaneously is virtually impossible. Thus, reconciliation of the objectives and actions of various stakeholders within the domain of an ecosystem must be a central element in implementing sustainable management strategies." 12/

Reconciliation of the objectives and actions of various stakeholders will be found in the political, not the ecological arena. The only fit stakeholders will accept is control.

Ecological processes work at all scales. There are small areas that are very productive and large areas that are virtual wastelands. The hydrologic cycle works over large areas, not because rain recognizes a fictional ecosystem, but because rain naturally occurs over large areas. Nutrients are cycled over large areas, not because photosynthesis and decomposition recognize a fictional ecosystem, but because sunlight covers the globe and life forms are abundant. That there is no habitat universally suited for all organisms is not because these organisms recognize any fictional ecosystem but because of differences in topography, site quality, climate, etc. Given the limitations of the site, the processes fit very well, whether on one acre or 1 million.

Productivity of land uses in America show the processes work very well within the private property boundaries we inscribe. It is in the commons and in countries where private property boundaries are not inscribed that productivity and sustainability suffer.

Lack of a rigid operational definition of an ecosystem gives the designer a blank check. Corruption and exploitation are inevitable. The exploitation is confirmed by a University of Michigan/Wilderness Society study of 105 ecosystem management projects in Ecosystem Management in the United States: An Assessment of Current

Experience. Four ecosystems were smaller than 1,250 acres (the smallest being 60 acres). Fifteen were 1,250 to 10,000 acres. Thirty-four were larger than 1 million acres with the Interior Columbia Basin Ecosystem affecting 144 million acres (225,000 square miles), an area slightly smaller than the original 13 colonies. The Gulf of Mexico Program covers 410 million acres. 13/

Delineation of the fictional ecosystem

Given that Mother Nature does not delineate ecosystems, who will delineate these fictional ecosystems? The answer is obvious, the self-interested elitists in the ruling class.

The delineation of these mythical ecosystems will be “based on only tiny fraction of the ecological information about the area they outline.” 14/ This is because of a problem that bedevils bureaucrats and statist academics in all efforts to allocate resources: the inability to collect and process information.

Tall Timbers Research Station, an ecosystem advocate, completed the re-census of the Stoddard Fire Plots. It took thousands of hours of labor over an entire year with more than 25 Tall Timbers research technicians, aides, interns, and volunteers involved. The Fire Plots are 84 one-quarter acre or 84 half-acre plots depending on which Tall Timbers’ report one reads. 15/

Obviously, a complete inventory of ecosystems at the scales reported in the Michigan study is impossible. No one can ever be sure that he has not missed something or that something has not changed that would change the conclusion. This will not stop bureaucrats, statist academics, and GAGs from applying results far beyond the scale of the data collected.

The fiction of ecosystem services and redundancy

From the mythical ecosystem, we devolve to the fiction of ecosystem processes, goods, and services. They are:

Processes: Hydrologic flux and storage
 Biological productivity

Biogeochemical cycling and storage
Decomposition
Maintenance of biological diversity

Goods: Food
Construction materials
Medicinal plants
Wild genes for domestic plants and animals
Tourism and recreation

Services: Maintaining hydrologic cycles
Regulating climate
Cleansing air and water
Maintaining the gaseous composition of the atmosphere
Pollinating crops and other important plants
Generating and maintaining soils
Storing and cycling essential nutrients
Absorbing and detoxifying pollutants
Providing beauty, inspiration, and research 16/

Fitzsimmons addresses the fiction of ecosystem processes, goods, and services:

"First, the benefits Constanza et al. see as services provided to humans by ecosystems (as organized, knowable, and discrete entities on the surface of the Earth) are, in essence, the serendipitous byproducts of individual living organisms seeking to survive and nonliving things following fundamental laws of physics and chemistry. For instance, they claim that pollination is a benefit humans derive from the actions of ecosystems; yet ecosystems do not pollinate anything. Individual food-seeking insects, birds, and other biota that move from flower to flower in normal pursuit of their species lifestyle are responsible for pollination. Constanza and his colleagues make a huge leap when they attribute to ecosystems the fruits of insect labor.

They make similar errors in asserting that ecosystems provide such services as climate control and water management. Researchers have long known that plants can impact climate; they both absorb and reflect incoming solar radiation, they alter the mix of atmospheric gases, and they can modify ground level circulation of the atmosphere. But they do so as individual plants, not as participants in some union of life forms intent on altering the atmosphere. Likewise, ecosystems do not manage or regulate water. The

fate of individual water molecules falling as rain is determined by physical forces like gravity, not the edicts of ecosystems. So it is that some of those molecules are bound up in the soil, others percolate down-ward to gather in aquifers, and still others eventually reach lakes and oceans.

To be sure, the presence or absence of vegetation, vegetation composition, soil makeup, topography, and other factors influence those happenings. But that is by no means evidence of the existence of a higher level entity called an ecosystem orchestrating the behavior of the water molecules to provide a service for humans or itself.

The second and more fundamental flaw in their analysis is the assumption that ecosystems are tangible objects that actually exist on the surface of the Earth. Ecosystems are mental constructs, heuristic devices, rather than real entities that Mother Nature placed on the landscape to await discovery by scientists who apply theory and/or agreed upon methodologies and protocols.

Indeed, no such methods or protocols exist. Consequently, in nothing more than a geographic free-for-all, researchers are able to fix the location, shape, and size of the geographic unit they call an ecosystem using whatever variables and means suit the project at hand....Such a laissez faire approach allows scientists to declare that an ecosystem is a dung pile, a whale carcass, a watershed, the entire planet, or any other bit of the Earth's surface that is convenient for the moment." 17/

A butterfly flaps its wings in Brazil and creates a tornado in Kansas

Silva Ecosystem Consultants, Ltd., British Columbia, tells us "Earth, from microbe to globe, is a whole system, interconnected and interdependent. Earth functions to sustain the whole in an equilibrium that is dynamic yet stable. ... All ecosystem composition (the parts) and structures (the arrangement of the parts) have a function (how the parts work together). If we lose the composition and structure, we lose the function."

This supposed interconnection is used to justify the holistic approach to resource management. The holistic approach is based on the premise that "earth operates as a series of interrelated systems within which all components are linked, so that a change

in one component **may** [my emphasis] bring about some corresponding change in other components and in the operation of the whole system." 18/

Mirroring the confusion inherent in a holistic approach, Levins writes "[m]uch very creative research has gone into showing the connectedness of phenomena that are usually treated as separate. It is even said that because of their interconnectedness they are all 'One,' an important element of mystical sensibility that asserts our 'Oneness' with the Universe.

Of course you *can* separate the intellectual constructs 'body' from 'mind,' 'physical' from 'biological,' 'biological' from 'social.' We do it all the time, as soon as we label them. We have to in order to recognize and investigate them. That analytical step is a necessary moment in understanding the world. After separation, we have to join them again, show their inter-penetration, their mutual determination, their entwined evolution and yet also their distinctness. They are not 'One.' The pairs of mutualist species or predator and prey are certainly linked in their population dynamics. But predator and prey are not 'One' until the last stages of digestion. There is a one-sidedness in the holism that stresses the connectedness of the world but ignores the relative autonomy of parts.

As against the atomistic and absolutized separations of reductionism, holists counterpose the unity of the world. That is, they align themselves at the 'oneness' end of a spectrum from isolated to 'one.' They look for some organizing principle behind the wholeness, some 'harmony' or 'balance' or purpose which gives the wholes their unity and persistence." 19/ The principal is that everything in life is interconnected and interdependent. We cannot damage one part without damaging the whole.

Adding to connectedness is the attempt to assign purposeful behavior to the mythical ecosystem. Levins writes that a "system... can exhibit dynamic, adaptive, goal-seeking, self-preserving and evolutionary behavior." 20/

The Real World

Nature is dynamic, but is it capable of purposeful (goal-seeking) behavior? For example, can a swamp decide when there is heavy rain that it will hold the floodwater like a sponge and release it slowly during drier times? Sierra Club says it can, but in the real world of gravity and evapotranspiration it cannot. Can a *Sequoiadendron giganteum* seedling say "I want to be as old and as big as the General Sherman" and

purposefully make it? Weeds, trees, stands, or fictional ecosystems are not capable of purposeful action.

A rehashing of some basic silvics shows that not only is all life not interconnected and interdependent, but when we lose the composition and structure of an area, the processes start anew. When Mount Saint Helens didn't "think like a mountain" and blew its top, life did not stop. The successional clock was re-set, but the processes continued.

In The Ecology of Natural Disturbance and Patch Dynamics, a number of authors discuss the dynamics of disturbance. In Chapter 1, White and Pickett state the obvious.

"The process of growth, death, and replacement ensure that biological systems are dynamic, if only on a local scale. ... Organisms, by their very nature, take up space and use resources; biological systems, on some level, are patchy. ... Equilibrium landscapes would therefore seem to be the exception, rather than the rule. ... At the very least, disturbance itself introduces stochastic influences on community composition that reduce predictability of response. ... Preservation of natural systems necessarily involves a paradox: we seek to preserve systems that change." 21/

"As a tree ages and increases in size, its efficiency in transporting water, nutrients, and photosynthate usually decreases. Its roots must support a proportionally greater aboveground biomass, and its photosynthetic tissues must support a proportionally greater mass of non-photosynthetic tissue. These factors, plus the tendency of the tree to develop a more massive crown, render it increasingly susceptible to smaller and more common disturbances." 22/

"The fall of a canopy tree as a result of senescence, environmental catastrophe, or, more likely, a combination of the two frees space, alters resource availability within the forest, and changes the immediate environmental influences on forest organisms. ... Because gaps can affect so many processes, the temporal and spatial patterns of gap creation interact with species strategies to determine forest richness and structure. ... Not only is the collection of gaps in a forest heterogeneous, but each gap is itself a mosaic that changes from the center to beneath the closed canopy." 23/

"[D]isturbance occurs in a wide variety of biotic assemblages; it occurs at all ecological levels of organization....Disturbance is often patchy. It may create discrete openings of gaps in either or both of the above- and below-substrate components of a system. ...

At one extreme are small, frequent disturbance gaps, while at the other are large, rare patches." 24/

"Disturbances have a profound effect on forest development since they kill vegetation and thus release growing space, making it available for other plants to occupy. Individuals and species which first occupy growing space during forest development have an advantage in maintaining it and excluding other plants. Forest composition of most areas is strongly influenced by disturbances, since natural and human disturbances occur in all forests." 25/

"[F]orests constantly and dramatically change in both time and space. ... The earth's climate has also changed dramatically; and plant and animal species are constantly migrating in response to climate and soil changes. Because of disturbances, species migrations, climatic variations, and other factors, a forest of a given structure and species composition exists at only one time and in one place. The patterns often appear unchanging because the rate of change is slow relative to the memories and life spans of humans." 26/

The real world of nature is brutal. "Nature undisturbed [by man] is not constant in form, structure, or proportion, but changes at every scale of time and space. The old idea of a static landscape, like a single musical chord sounded forever, must be abandoned, for such a landscape never existed except in our imagination... We see a landscape that is always in flux, changing over many scales of time and space, changing with individual births and deaths, local disruptions and recoveries, larger scale responses to climate from one glacial age to another, and to the slower alteration of soils, and yet larger variations between glacial ages." 27/

"To understand the processes of birth, growth, death, and entire forest generation, one must realize that trees compete at all times for essential resources -- light, water, minerals, and space. In any particular spot in a forest, the tall trees shade smaller ones, quietly suppressing their growth. In this quiet competition, a tree 'wins' by growing faster than and shading its neighbors before they shade it." 28/

"Most forest scientists now feel that the interaction between tree species usually results in one individual's having an advantage and dominating or killing another. This interaction is termed competition. Unlike mutualism, competition implies that trees have not evolved a dependence on each other but actually can impede other's growth. Competition, not mutualism, is now considered the primary pattern of interaction among holarctic tree species, and probably among trees in other floristic realms. ... Elimination of one species in a stand should negatively affect other

components of the stands if strong mutualistic inter-dependencies exist among tree species. Species which have been or are being eliminated by pathogens – such as American chestnut, the American elm, and the western white pine – have been replaced by other species. Often, the remaining species grow better without the eliminated one. The tree species in each community had not evolved such interdependency that they could not live without these other species.” 29/

In the forest, “most trees die young in the struggle for the forests scarce resources. ... At best only a few of the many thousands of seedlings produced by a typical mature tree can survive and grow to achieve canopy position and reproductive status. Most die as a direct or indirect consequence of failure to compete successfully for light, water, or soil nutrients.” 30/

“Who wins? For predicting the likelihood of survival of an individual tree, the most useful information is different for each of the forest development phases. During the establishment phase [stem initiation], dispersal to safe sites is critical, and survivorship may depend both on small-scale spatial and temporal heterogeneity and on competition from shorter-lived pioneer species. These factors, plus genetic differences among individuals, result in considerable variation in size and vigor of individual trees as the population enters the thinning phase [stem exclusion].

Because few trees survive the intense competition of the thinning phase, any tree that starts at a competitive disadvantage will almost certainly die. While not all forms of competitive disadvantage are readily measured, several, including size (diameter, height, and weight), vigor (diameter increment or weight increment), and proximity of competitors (calculated using distance to and size of neighboring trees), have been shown to have high predictive value.” 31/

Following competition-induced mortality or any other disturbance, regardless of size, do plant or tree species outside the disturbance area (includes edge effects) know a death or disturbance happened. How do they know it? Where is the evidence that organisms know of this universal connectivity or interdependence? Plants and trees complete their life cycle oblivious to the fate of other organisms. A tree or plant may respond to a change in photo-period or germinate in an opening resulting from the death of a neighboring tree or plant, but it does not know why the change or opening occurred.

The basic unit in nature is the individual organism. Nutrient cycling, photosynthesis, NPP, etc. have value and meaning as expressed through the reactions of individual organisms. Absent the individual organisms, there is no assemblage to describe.

The forest is described by these individual organisms. The other real world descriptive boundaries in the forest are stands and property boundaries, specifically private property boundaries.

The Pseudo-science of Ecosystem Management

Supporters of the fictional ecosystem demand that it be managed. Enter the pseudo-science of ecosystem management. There are several definitions of ecosystem management. The Ecological Society of America (ESA) defines it as “management driven by explicit goals, executed by policies, protocols, and practices, and made adaptable by monitoring or research based on our best understanding of the ecological interactions and processes necessary to sustain ecosystem structure and function.” 32/

ESA further claims “ecosystem management must include the following:

1. Long-term sustainability as fundamental value,
2. clear, operational goals,
3. sound ecological models and understanding,
4. understanding complexity and interconnectedness,
5. recognition of the dynamic character of ecosystems,
6. attention to context and scale,
7. acknowledgement of humans as ecosystem components, and
8. commitment to adaptability and accountability.” 33/

A management policy that cannot define its basic unit, the ecosystem, cannot have clear, operational goals. It cannot be based on sound models or understanding at any scale or in any context.

That life is complex is no argument for the ecosystem or ecosystem management, especially by government. No entity is less prepared to deal with complexity or to be adaptable and accountable than bureaucracy.

Wear writes “Ecosystem management has yet to be clearly defined in operational terms. It is perhaps best to view it as an emerging professional philosophy or ideology and not yet as a set of rules or guidelines.” 34/

Intended or not, Wear has told the truth. Ecosystem management is part of an ideology of state control. Government is adding to its power base by acquiring land, but no one expects government ownership of all land. Many seem content to maintain some fiction of property ownership by letting individuals hold paper title to their property while government central planners tell them how they may use it. This is the way the fascist state treats property. Ecosystem management is part of an ideology that is essentially fascist.

The real usefulness of the ecosystem concept is not as a natural one but as a political one. Mother Nature has no need of an ecosystem concept to function. The political community is where the ecosystem concept has its value.

Supporting the political value of ecosystem management, Jim Burchfield, University of Montana, says “EM should be: more about processes than answers, driven by values and a political process, and less about assessment and more about central planning.” 35/

Dr. Steven Yaffee chimes in that ecosystem management “requires the use of decision making processes that are inclusive and that develop a robust understanding of the ecological and social processes influencing a landscape. Such processes are collaborative in that they call for the involvement of multiple stakeholders in defining and implementing desired direction.” 36/

Giltmier, reviewing The Politics of Ecosystem Management, writes “... for those who long for less and less government in American lives; for those who believe land ownership is more sacred than the Constitution [the Constitution makes no provision for ecosystem management but does believe private property should be protected]; for those who believe that the individual is more important than the community; this book will be a devil to be exorcised.” 37/

Ecosystem management will mean more government control. It will intrude on private property rights. If a justification is to be created using the Constitution, it will result in a further perversion of that document and our long-lost republican form of government.

As for the individual, the message of ecosystem management is “that the State is more important than the individual, that individuals must be willing and ready to sacrifice themselves for [the] nation.” Adolph Hitler 1933 38/

The ecosystem management literature is filled with this command-and-control, central planning mentality. Ecosystem management is a process rife with opportunities for exploitation and corruption by government and its allies.

Conclusion

“Ecosystems are inherently subjective and infinitely elastic. They are mental constructs, designed for categorical convenience, not objective realities in nature. As such, there are no objective criteria to determine where one ecosystem ends and another begins. Like a fingerprint, every spot on the surface of the earth is unique. Thus, as a matter of law, regulating ...ecosystems is an open invitation to regulating anything or everything.” 39/

“Providing the federal government with the authority to centrally manage ecosystems would entail a massive transfer of power from the individual to the state. Federal regulators and third-party activists [GAGs] would inevitably be involved in land-use decisions throughout the nation; since most ‘ecosystems’ are in the hands of private landowners, one could not hope to seriously ‘manage’ ecosystems without ‘managing’ private land use. That would probably occur through the application of a greatly expanded regulatory framework and virtually unlimited opportunities to use or threaten to use litigation if government demands regarding private land-use decisions were not met.” 40/

Lackey leaves us with a sobering thought. “[T]he concept has been embraced widely by politicians and appointed officials. At least in the political arena, the debate is concluded whether or not ecosystem management is a good idea: it *will* be implemented, or at least attempted, in word if not in deed.” 41/

“The only thing necessary for the triumph of evil is for good men to do nothing.” Edmund Burke

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