



Collier Soil and Water Conservation District

Gazetteer

County In-Lieu Fee Mitigation Project

Human impacts on multiple ecological networks act synergistically to drive ecosystem collapse...

- During climate extremes, whether droughts or flooding rains, those on the land feel it most. Agriculture suffers first and most severely--yet eventually everyone feels the impact.
- Drought disrupts crop programs, reduces breeding stock and threatens permanent erosion of the capital and resource base of farming enterprises.
- Declining productivity affects rural Collier County and our economy.
- The risk of serious environmental damage, particularly through vegetation loss and soil erosion, has long term implications for the sustainability of our agricultural industries.
- Water quality suffers and toxic algae outbreaks may occur; plants and animals are also threatened.
- Brushfires and dust storms often increase during dry times.
- The identification of thresholds that could potentially lead to ecosystem collapse is a central concern for conservation biologists.
- Unprecedented anthropogenic changes are making ecosystems more vulnerable to catastrophic shifts as a result of the loss of species and their associated ecosystem services.
- The gap between theory on ecosystem collapse and practical responses is very shallow.

To embrace or not? It can get awkward.

We frequently encounter misused and misinterpreted scientific evidence to advance ideological viewpoints. As a soil and water conservation district, it is our ethical obligation to confront pseudoscience and anti-science attitudes! Having said that, we know that small changes can make a difference and believe that now is the time to replace idealism with reality.

If you classify yourself as someone who cares about ecological services, you are indeed obliged to challenge and attack bad science whenever you encounter it and recommend scientific alternatives when none were considered.

The *Land Development Code* demands a high level of intellectual and resource investment. We are concerned that many parts of it were incorporated without any science and, as a result, irreversible effects of land degradation will continue to occur if the land designations of "sending," "neutral" and "receiving" are not corrected.

Although the environmental and social impacts of an incomplete *Land Development Code* may exceed those of land degradation at some point in the future, the effects of land degradation are occurring now which requires reconsideration of how we mitigate for loss of ecological services in the functional watershed.

Land degradation generally reduces plant-water availability by increasing runoff and reducing the water-holding capacity of soil through erosion, loss of organic matter and the deterioration of soil structure. This creates "edaphic (soil-related) droughts" during otherwise "normal" years. Similarly, land degradation exacerbates water deficits that result from seasonal demand.

During large rainfall events, land degradation intensifies flooding, as infiltration is reduced and canals channel water more quickly to Naples Bay and the Gulf of Mexico. Awareness and investment at multiple levels within the functional watershed by private, government and non-governmental organizations are required. We have enough science. We don't have any money and that's the rub!

When we begin discussing the value of in-lieu fee mitigation program in earnest, we will be at Step 1 of recognizing the land potential, both the potential to support multiple ecosystem services and resilience. Step 2 will occur when we target investment in surface water management across the functional watershed by creating a flow-through system of water management that holds water until it transpires or evaporates.

The area east of CR 951 may be the last opportunity we will have to preserve our watershed. We believe it's time that research was conducted to improve drought management.

- Sustainable surface water management practices need to identify which species are most at risk from human activities and provide mechanisms to determine the presence of critical collapse-related thresholds.
- A dramatic reduction in plant productivity is the first reaction of the ecosystem to external perturbations, but the Land Development Code tends to pay little attention to how these changes reverberate in other ecological networks.
- It's time to develop a new perspective under a more realistic scenario, one that allows the integration of a plethora of ecological interactions to occur synergistically.
- It's time to quantitatively document how human effects cascade and eventually lead to ecosystem collapse.
- We believe it's time to fund an in-lieu fee mitigation program and gather all of our public lands together, determine mitigation potential and proceed with public works that improve water quantity throughout the county.

Contact Us:

Collier Soil and Water
Conservation District
14700 Immokalee RD
Naples FL 34120-1468
Phone: (239) 455-4100
FAX: (239) 455-2693
www.collierswcd.org

During climate extremes, whether droughts or flooding rains, those on the land feel it most. Drought disrupts crop programs, reduces breeding stock and threatens permanent erosion of the capital and resource base of farming enterprises.

The risk of serious environmental damage, particularly through vegetation loss and soil erosion, has long term implications for the sustainability of our agricultural industries. Water quality suffers and toxic algae outbreaks may occur; plants and animals are also threatened. Brushfires, low lying smoke and dust often increase during dry times.

Richard Feynman, a California Institute of Technology professor, during his wildly acclaimed "Feynman Lectures" said, "there is a fact, or if you wish, a law governing all natural phenomena that are known to date. There is no exception to this law—it is exact so far as we know. The law is called Conservation of Energy" and it has always meant: Is that how Mother Nature would solve this problem where you live? We live in Big Cypress Basin.

An ecological footprint is one of several tools that may be used to illustrate the pressure placed on the environment by our production and consumption of natural resources or more simply the capacity of Big Cypress Basin to provide resources and absorb wastes. When our functional watershed's ecological footprint exceeds its biocapacity, an ecological deficit will occur.

Big Cypress Basin is isolated from the Everglades and Everglades Area. Within this functional watershed, various forms of matter, including water, are in constant cyclic flow. Through these processes, an abiotic (non-living) template of air, water and soil exists, upon which life can exist. The physical template of the functional watershed structure is ultimately determined by varying combinations of climatic, geomorphic and hydrologic processes

Considered together, the natural biodiversity of plants, animals and microbes functions in many ways to enhance the health and quality of life enjoyed by human society. In view of the likely continued growth our human population, and the resultant alteration of the functional watershed's fragile natural ecosystem, greater efforts must be made to conserve biodiversity as a natural and essential treasure and consider what our biocapacity is locally. A good start point would be to discuss what it is for our functional watershed.

Finally, we argue that static protected areas will not be sufficient to conserve biodiversity! What we need is emphasis on watershed-scale conservation that considers habitats and maintenance of ecological functions of areas under intense human use. We must reassess and, where needed, modify the *Land Development Code* to include ecological services.

Focus must shift from efforts to maintain existing ecological conditions toward the challenging task of managing—or even facilitating—inevitable system transformations. Management strategies must be robust enough to cope with a wide range of possible conditions and must incorporate multiple opportunities for adjustment in response to variability and change—monitoring, experimentation and a capacity to evaluate and modify management actions.