



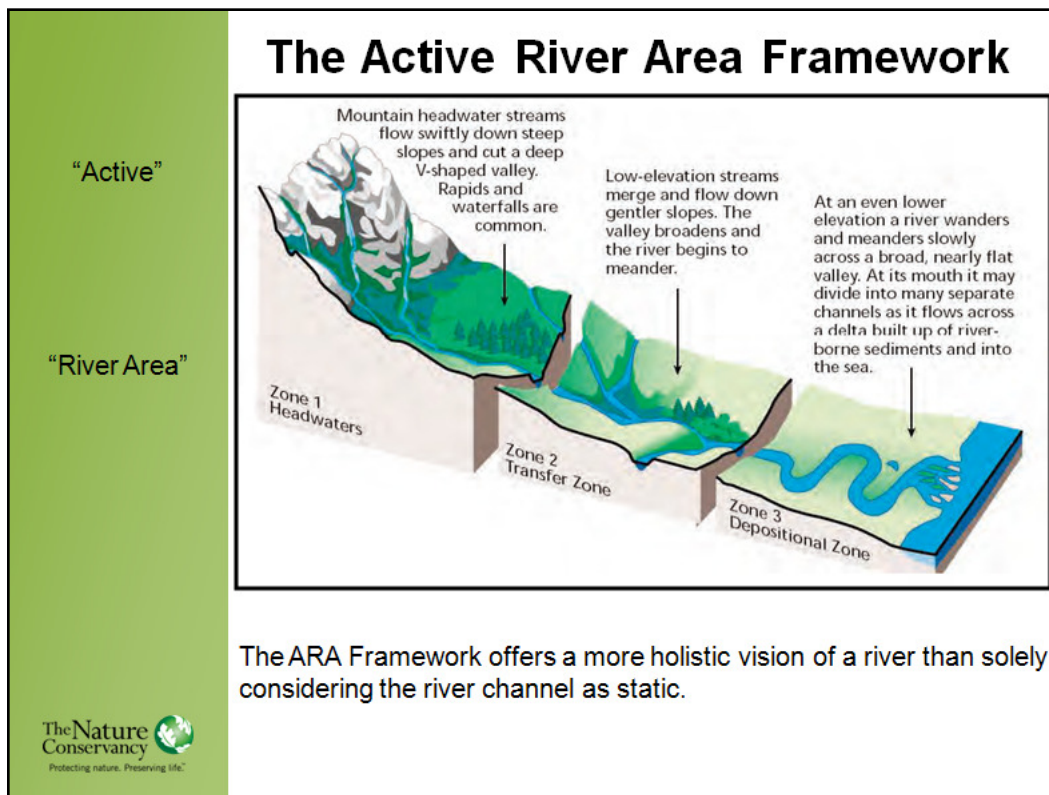
## **Integrating Floodplains into Open Space**

### **Planning:**

The Nature Conservancy's  
Active River Area Framework  
Zachary Odell; August 18, 2011

Hello, my name is Zachary Odell. I am the Director of Land Protection for the Nature Conservancy in Central and Western New York. I am here today to provide three things: an introduction to the Active River Area Framework (a holistic river system perspective that the Conservancy developed three years ago), offer a localized example of how using the ARA framework may influence land use decisions, and to identify how this framework may be integrated into open space planning.

I want to emphasize here at the start that this ecological framework is a different, not an ultimate understanding of river systems and that the Conservancy and its conservation partners have the luxury of spending resources on this kind of work. It is a part of our mission. And while this is our guiding framework for floodplain conservation we do not assume that it will work for everyone as they contemplate open space planning, but hope that others will use all or part of it, seek Conservancy assistance, learn from it, and communicate lessons learned back to us and to others.



This diagram spatially represents how we delineate an active river area, from its headwaters or source to its end.

**“Active”** indicates the dynamic and disturbance-driven processes that form and maintain river and riparian systems and their associated habitats and habitat conditions.

**“River area”** represents the lands that contain both aquatic and riparian habitats and those that contain processes that interact with and contribute to a stream or river channel.

GO THROUGH EACH ZONE.

Traditional conservation planning processes often use the watershed as a unit of analysis. This framework hones in on the most important places in a watershed, mainly the headwaters and floodplains/lower elevation areas and the surrounding land with which the river interacts. Various processes occur at each point, and are unique and equally important in that they sustain system health and different habitats. Altering the natural processes at any one point or at any one time ultimately impacts whole system health leading to various consequences.

In short, river health depends on a wide array of processes that require dynamic interaction between the water and land through which it flows.

## Points of Interaction



The Nature Conservancy  
Protecting nature. Preserving life.™

This is a picture of the depositional zone in the Active River Area. This is often the most dramatic portion of a river as it meanders its way across lower elevations. I like this picture in that it provides an aerial shot of the points of interaction between an Active River Area and human land use. It is common for the land in between meanders to be used for a variety of services, however this often leads to the urge and practice of keeping the system static, thereby eliminating the natural variations in flow and land/water interaction.

## Ecosystem Benefits– The Language of Your Community

### Examples of Three Types of Benefits and Values from Nature

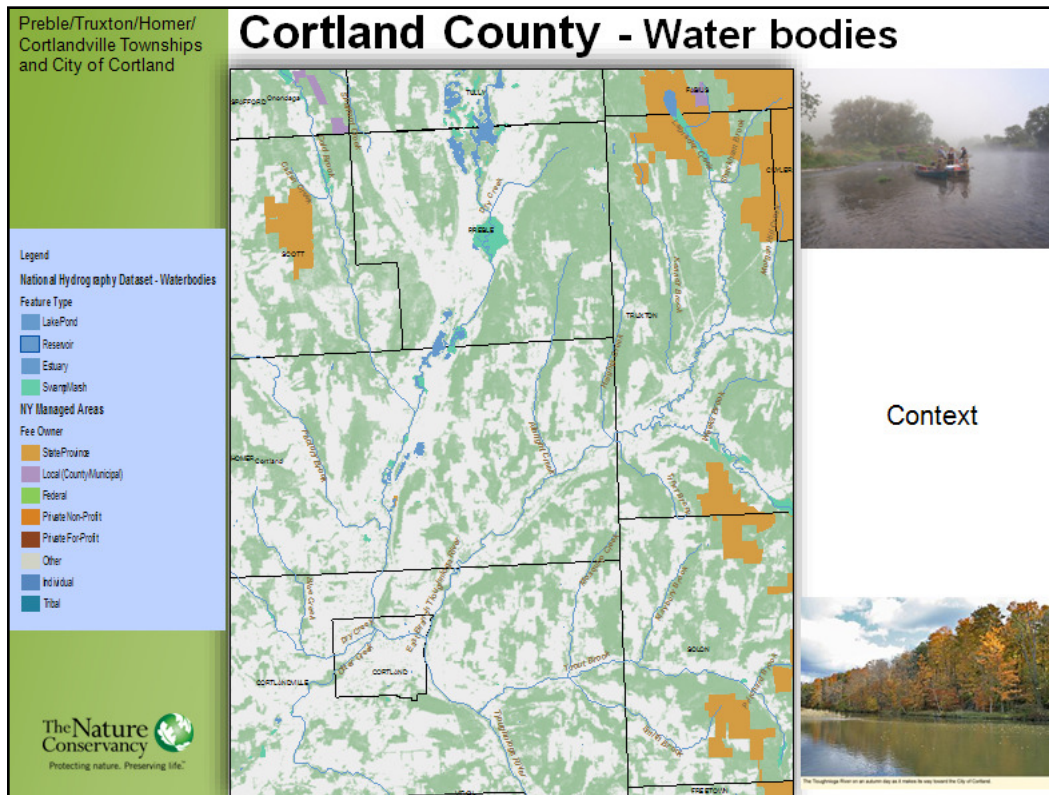
Ecosystem Products	Ecosystem Services	Non-material Benefits
Food	Biogeochemical/nutrient cycling	Recreational
Fiber	Seed dispersal	Scientific
Building materials	Soil formation and retention	Educational
Fuel	Soil fertility maintenance	Spiritual
Medicines	Climate regulation	Historical
Ornamental plants and pets	Decomposition of wastes and pollution	Cultural
	Natural pest control by predators	



Adopted from Byers, 2010

While the ARA framework provides an ecological perspective on rivers and their contemplation within open space planning, we all know that ARA language (i.e. meander belts, material contribution zones, etc.) is not the common language of a community as they begin to consider how to conserve open space. Identifying ecosystem benefits to communities, whether explicitly identified as a step in the conservation planning process or not is often the impetus for beginning a planning process in the first place. And more often than not, these recognized ecosystem benefits are the backbone of various steps within the planning process, such as criteria for data collection, prioritization, and strategy development.

The ARA is a concept and tool that if employed holistically addresses some of these benefits. For example, nutrient transport, soil formation and fertility maintenance, recreational opportunities, economic viability, and cultural significance.



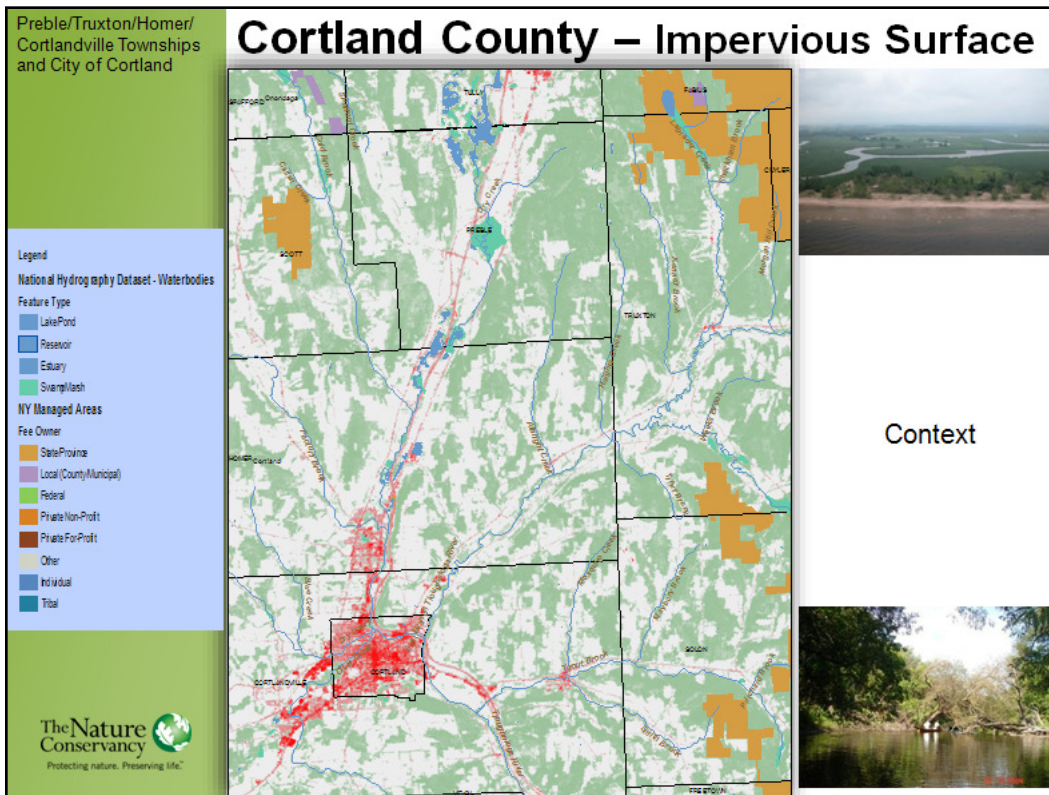
So let's bring the ARA concept a little closer geographically. This map depicts the confluence of the east and west branches of the Tioughnioga River as well as portions of its headwaters. I chose this location to demonstrate the benefits of individual town open space planning efforts, but also show the benefits of cross-municipal planning efforts as relates to a river system, which the ARA framework encourages. I will focus on three towns (Truxton, Preble, and Homer) and one city (Cortland) that are impacted by this portion of the Tioughnioga Active River Area. As I go through this quasi case study, keep in mind the many possible ecosystem benefits that each community may consider.

Each of these municipalities might arrive at the need or desire for considering the Tioughnioga River and its headwaters. The Context here is natural, showing the river system, forest cover, and protected lands.

For Truxton the number of acres already protected could be viewed as a misrepresentation of river protection in that only portions of the headwaters are in protected status. And while Truxton may have already conducted an open space plan, perhaps it has focused primarily on forest protection and is in need of floodplain integration.

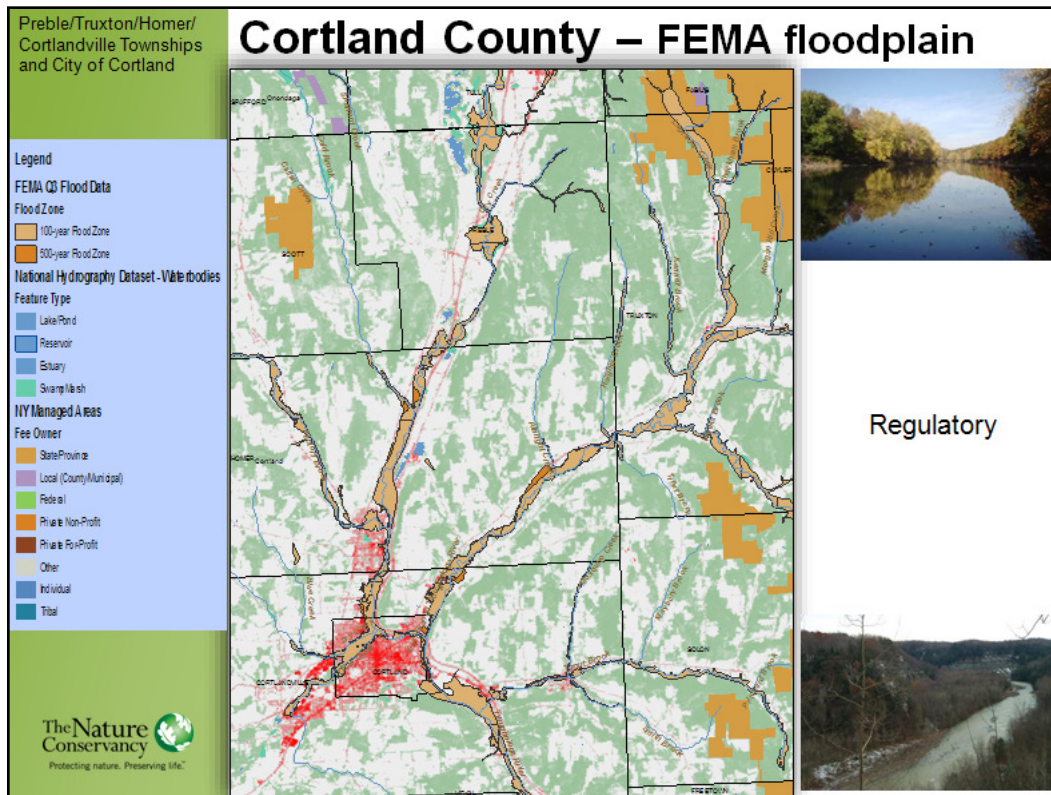
Both Preble and Homer have no protected land. From this map one can also see that both Towns have considerable lower elevation floodplain. If either of these Towns decide to conserve various ecosystem benefits associated with the river, they may want to integrate the active river area and forest conservation goals.

But what I find most interesting about this portion of the river is that the City of Cortland is perhaps the largest benefactor of active river area conservation.

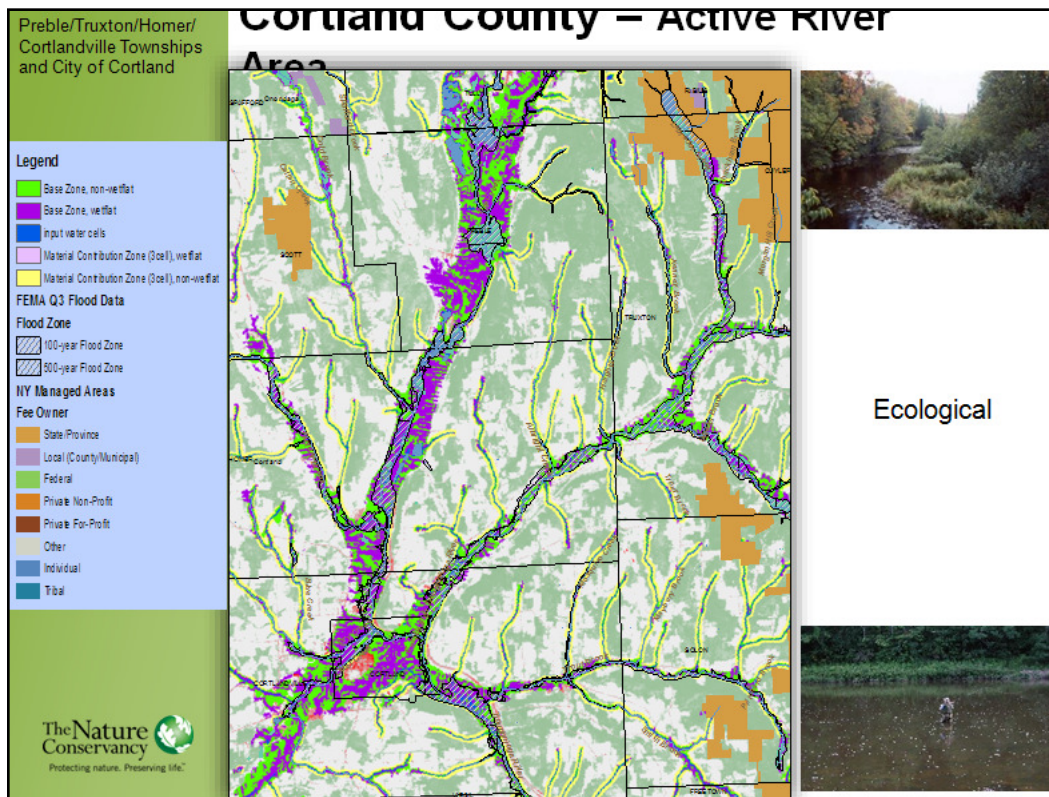


Looking at this next slide, notice that the red appearing represents impervious surfaces, mostly associated with development.

The context of this slide is that we are now overlaying social land use decisions that may or may not have considered how dynamic qualities of the river system would influence the community. And perhaps now, considering the river system as a whole will benefit future land use decisions, in one case future development.



This map provides a regulatory context for us (the FEMA floodplain), which for most communities across the U.S. doubles as the ecological context for the river system. Realistically, most communities may be limited in that the FEMA maps are all they have to incorporate into land use decisions and open space planning. While the FEMA floodplain provides useful spatial information, using this alone for planning purposes may lead to missed needs and opportunities for a community. What do I mean?



This final map provides an ecological context, the Active River Area (represented by five colors.) Note the overlap with FEMA, but also new parts of the active river area that are important for river function and health. As I stated earlier, I used this example to show the potential need for a more comprehensive view of the river in meeting the needs of the three towns, but also the City of Cortland, because Cortland is directly impacted by land use decisions by the Towns of Preble, Homer, and Truxton. The five colors of the ARA data layer here categorize the river system – GO THROUGH THE FIVE COLORS.

If the active river area is allowed its natural dynamic course, water and land interact in such a way that water moves not only down a river but in and out of adjacent land. Note that the FEMA floodplain does not account for the totality of this movement. And we all know that very few communities conserve the entirety of the FEMA floodplain in its natural state, because it has usually been altered. With the ARA, there are other important lands for the river that may be conservation opportunities and that may provide enough natural variability and hydrologic connection. If these towns decide to strategize about open space conservation without conserving enough natural active river area, the river's ecosystem service of water retention and dispersion for the City of Cortland could be compromised, leading to impacts on human health and safety, as well as increasing municipal costs for storm water management, transportation, flood mitigation, and continued hard engineering repairs and modifications.



## The Active River Area Framework:

provides community access to a spatially explicit river system framework; access that has not existed in the past. It is an opportunity for a different way of looking at water resources in a community.

provides data that can be used in open space planning in both simple and sophisticated spatial analyses.

helps communities integrate ecological and regulatory needs in hopes of safeguarding the ecosystem benefits a river system provides.



In short, the ARA framework may expand a communities tool kit and make for a more comprehensive approach to open space planning, ultimately supporting the Ecosystem Services valued by each community.



**Zachary Odell**  
**Director of Land Protection**  
[zodell@tnc.org](mailto:zodell@tnc.org)  
585.546.8030 ext.33