

Institutional scale demand for local biomass feedstock – a revenue source for green infrastructure?

Michael Collins

Center for Natural Capital

Biomass for Energy, Economy, and
Nature Conference

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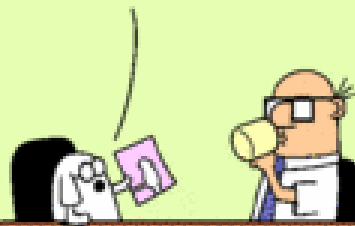
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IDENTIFIED YOU AS A
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IF WE CAPTURE THIS
FREE SOURCE OF
ENERGY WE CAN POWER
A SMALL OFFICE
BUILDING.



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I GIVE
AND I
GIVE.



The Problem:

Local governments are under increasing pressure for cost effective environmental services:

- Reservoir and run of river intake clean water (quality)
- Federal government TMDL (Bay Watershed) – (quality)
- Increased stormwater (volume and quality) responsibilities

The Solution:

Green Infrastructure

*(includes wood and native warm
season grass biomass)*

+

Grey Infrastructure

(concrete and steel)

Where's the Business Opportunity?

Low cost feedstock in water supply watersheds

Case Study – South Fork Rivanna River Watershed, Charlottesville

- reservoir constructed late 1960s
- currently 70% forested
- significant sediment problem
 - 25% overland 75% legacy
- ~ 10% of watershed is unimproved pasture

Rivanna Forests to Faucets

Proof of Concept Project 2009-2013

Purpose –

Create a Financial Linkage between Urban Water Consumers and Rural Landowners

How hard can that be?

Landowner Payment Findings

- Landowners will enter into voluntary afforestation contracts for **\$600-\$850 per acre per 20 year contracts** – we spent ~ 200k testing
- Landowners will do voluntary Forest Conservation Easements for ~ \$100/acre (perpetuity)

Green Infrastructure Cost Effectiveness Findings

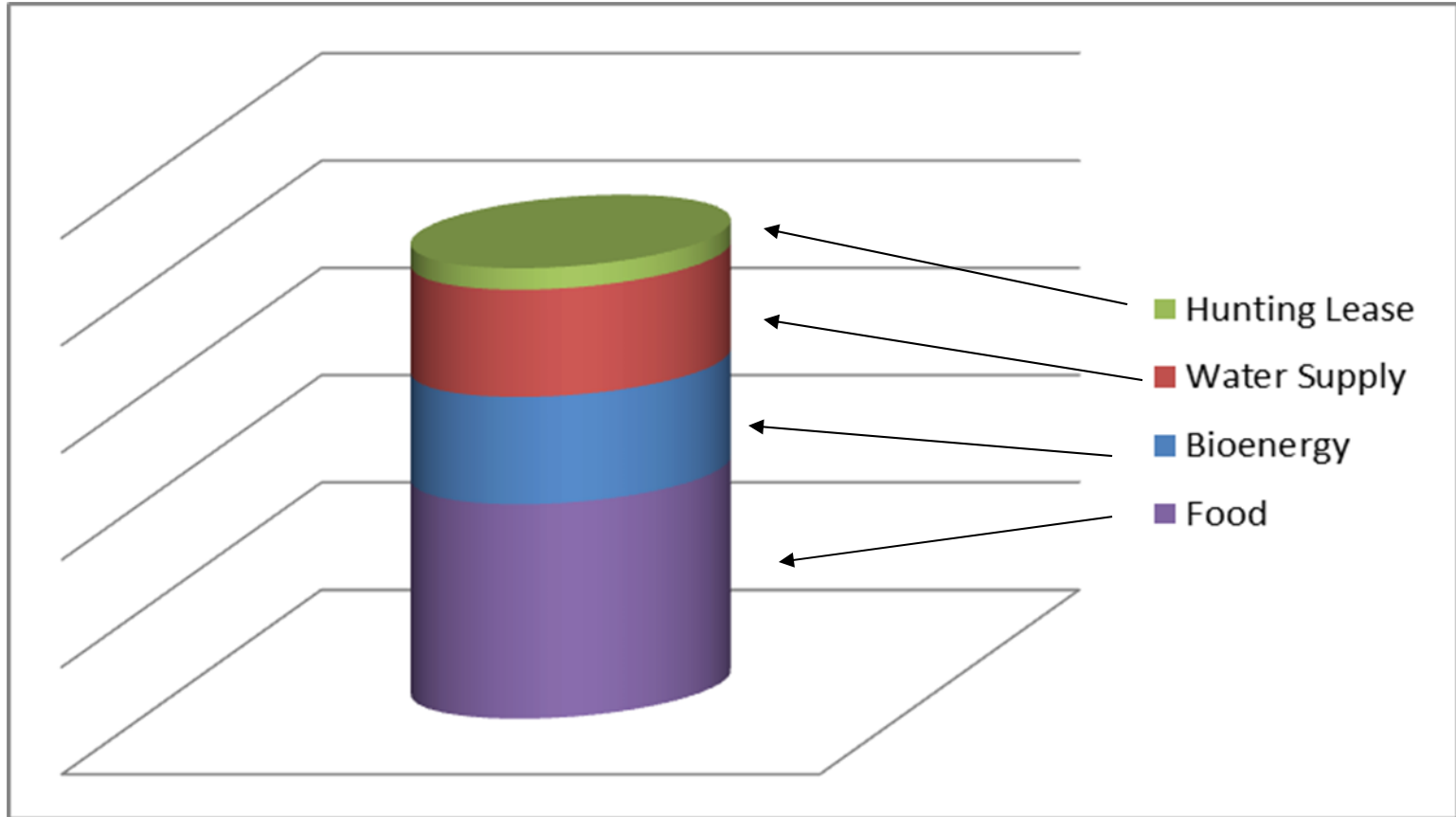
- Dredging sediment cost effectiveness ~\$15/ton
- Afforestation cost effectiveness ~ \$1-15/ton
- Forest Conservation Easement cost effectiveness ~ \$6/ton
- Optimum Environmental Expenditure Scenario for Maximum Reservoir Lifetime – Dredging, Afforestation, Easement Blend - ~\$4/ton

With Planning Horizon 30 Years or Longer

Bioenergy Payments

- Grass - FDC Enterprises - ~\$50/acre per year (10 year contract)
- Wood – David Richert - ~\$50/acre per year (40 year contract)

Stacked Landowner Payments



Create Future Watershed Scenario

Click arrow to make selection and then click on box to show blue fill

Green Infrastructure

VALID ENTRY

- Select Afforestation Likelihood of Conversion (ALOC) (1=100% threat)
- Select Easement Likelihood of Conversion (ELOC) (1=100% threat)
- Select % of Forest Converted to Residential Development per Year
- Select Planning Horizon (years)
- Select Yearly Afforestation Expenditure (dollars)
- Select Afforestation Contract Amount (dollars)
- Select Afforestation Contract Term (years)
- Select Yearly Forest Conservation Easement Expenditure (dollars)
- Select Easement Payment Amount (dollars)

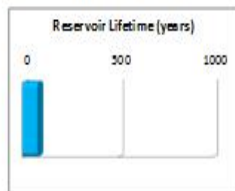
Grey Infrastructure

- Select Yearly Dredging Expenditure (dollars)
- Select Dredging Cost (dollars)

Water Supply Reservoir Metrics

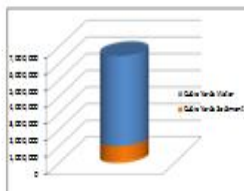
Reservoir Lifetime

(Assuming no additional expenditures beyond horizon)



76.92 Years

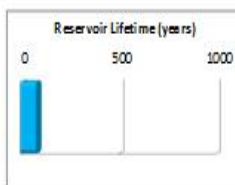
Reservoir Capacity



Sediment (CY) 1,013,535

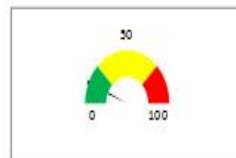
Reservoir Lifetime

(Assuming continuing expenditures beyond horizon)



76.95 Years

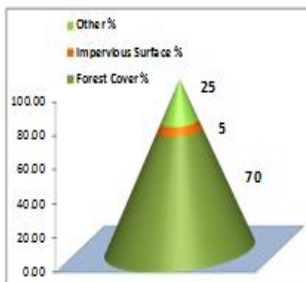
Infrastructure Lifetime Environmental Return on Investment (EROI)



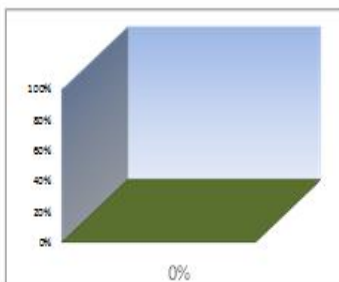
Infrastructure Lifetime EROI (\$/Ton) \$12.55

Watershed Metrics

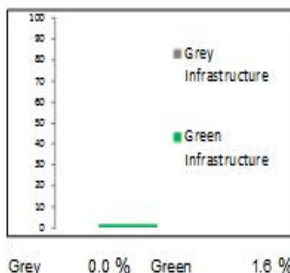
Land Cover



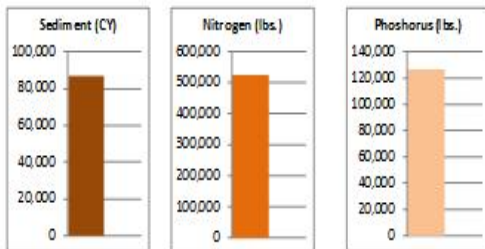
Portion of Watershed Forested Land Cover Threatened with Residential Development



Portion of Sediment Load Delivered to Reservoir Reduced by Program During Planning Horizon

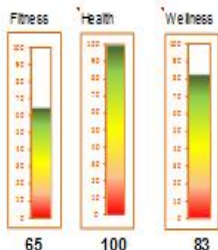


Load Delivered to Head of Reservoir



Watershed-Reservoir Wellness Index

Current Watershed Wellness



Future Watershed Wellness




Full Screen
Close Full Screen

So, where are the water
supply services buyers and
sellers?

A large, multi-masted sailing ship with many sails is shown on a desert dune. The ship is white and has several masts with many sails. The dune is a warm, golden-brown color. The sky is a pale, hazy yellow, suggesting a bright sun. The overall scene is surreal and dreamlike.

Looking for a big project
mirage?

A photograph of a busy outdoor market. In the foreground, a wooden table is filled with fresh green leafy vegetables and red tomatoes. A woman in a purple shirt is looking at the produce. In the background, other people are visible, including a man in a blue shirt and a woman in a blue cap. The scene is lively and suggests a community market setting.

They are here!
already buying, and ready to buy
more, if they get real value at a
fair price in a no hassle
transaction

We just need to get out of our
own way