Since 1983, The Freshwater Trust has worked to fix Oregon's rivers and streams. As a leader in freshwater conservation, The Freshwater Trust focuses on practical solutions for restoration work, at a pace and scale necessary to meet freshwater challenges and provide healthy, functioning streams now and for future generations. With its focus on quantified conservation outcomes and water quality trading, The Freshwater Trust clearly demonstrates how conservation can harness market forces for proven environmental gain.

**Water Temperature Problem**
Streams across the United States are often too warm. A lack of streamside shade (due to removal of trees for development and agriculture many years ago) is a major contributing factor, although regulated entities like factories, utilities and wastewater treatment facilities also contribute to increased stream temperatures by discharging clean, but overly warm, water from their pipes. Over the last 40 years, regulations from the EPA under the Clean Water Act have been so successful limiting chemical pollution from pipes into our waterways that they are now focusing on more broadly distributed water quality impairments like temperature. Under new laws, regulatory agencies responsible for protecting water quality are now requiring regulated entities to cool or offset clean but warm discharge into waterways.

**Engineered Solution**
Historically, municipalities that need to meet regulatory compliance for warm water discharge would likely look to the best available technology. That would probably mean building an expensive, streamside cooling tower or chiller, a depreciating asset with high associated operating costs and energy requirements.

**Restoration Solution**
Recent guidance issued by the EPA and the Oregon Department of Environmental Quality has allowed these entities to examine alternative ways to gain compliance for their warm discharge. Long known as a restoration action that creates shade to reduce water temperature, streamside tree and shrub plantings are now approved by regulators as a way to meet temperature compliance requirements and also address the lack of streamside shade.

**Water Quality Trading Background**
Over the last seven years, The Freshwater Trust has worked with the Willamette Partnership and numerous other organizations, agencies and regulators to build the science and credibility standards necessary to calculate the services provided by ecosystem restoration. The amount by which a tree’s shade reduces the sun’s impact on a river or stream – an ecosystem service – can now be measured and quantified into a credit that can be purchased by municipalities to gain regulatory compliance.
Here’s How it Works:

1. A regulated entity contracts with a qualified partner with restoration expertise to generate a certain number of temperature credits, which the entity will use to offset the impacts of its warm effluent. Rather than simply offsetting the impacts 1:1, this system requires entities to purchase credits at a rate of 2:1 to ensure overall ecological gain.

2. The eventual cooling and filtering benefits of the planted vegetation are calculated using rigorous standards approved by DEQ and then converted into credits.

3. After planting and calculating the credit value from the project, a neutral third party verifies the validity of the generated credits, which are then serialized and registered.

4. Once credits are registered, the credit producer submits an invoice to the regulated entity for the temperature credits. The landowners who allowed trees to be planted on their property are paid an annual “rental” fee.

5. Projects are maintained and monitored annually for a minimum of 20 years to ensure sites are performing as intended and meet the approved temperature credit standards.

Benefits:

- NPDES permit holder achieves regulatory compliance through significant river restoration projects to benefit freshwater species.
- Realization of measurable ecological uplift on our waterways plus the secondary benefits trees provide like carbon reduction in the atmosphere, habitat for birds and other species, streambank stabilization to control sediment and reduction of runoff from agriculture and roads.
- Rental payments go to landowners for allowing restoration activities on their land, providing a steady source of income for 20 years.
- With more than 80 cents of every restoration dollar staying in the local economy, most of the cost of the project stays local. Every $1 million spent on restoration creates up to 20 jobs.
- Restoration solutions generally cost much less than an engineered solution.
- Guaranteed maintenance and monitoring of projects (historically not funded).
- Increased pace and scale of restoration projects needed to address our mounting freshwater challenges.

Application to Nitrogen & Phosphorus Impacts

The same system currently working in Oregon for water temperature can also be used to generate nitrogen and phosphorus offsets. A trading protocol for nitrogen and phosphorus has been approved in Oregon, replicable elsewhere.