

H.814 Bill Explanation:

The Role of Large Riverwood and Insects in Improving of Water Quality

Rep. Cynthia Browning 2/18/14

This bill proposes a pilot project in a Lake Champlain basin tributary to test the proposition that large wood structures can decrease levels of excess nutrients through sediment storage and increases in populations of aquatic insects. (Section 4)

The bill also defines all of the relevant terms and lays out regulatory criteria for the installation of large wood structures. Such activities are currently regulated and permitted, but apparently there explicit criteria are lacking.

Large woody debris in streams and river may have a positive role to play in removing excess nutrients from surface water and improving water quality. This could occur in two ways: 1) woody structures can retain sediment which carries nutrients with it, and 2) woody structures can create habitat for increased numbers of aquatic insects who sequester nutrients within their bodies.

(1) Woody structures could be either tree materials that fell into the waterway naturally or structures deliberately designed and installed. Either way, to function properly the stream or river in question should have stable river dynamics including wooded or brushy banks, appropriate horizontal or vertical variation in streambed pattern, and some degree of flood plain access. The tree materials will tend to retain gravel, soil, and sandy sediment that enter the stream system, sorting the particles into banks and bars around the wood and concentrating the water flow into a narrower main channel. This will slow the rate at which sediment and the nutrients attached to it reach downstream waterbodies.

(2) Woody structures can also provide additional habitat for benthic macroinvertebrates. “Benthic Macroinvertebrates” are aquatic insects. Large riverwood collects smaller branches, twigs, and leaves. This organic material provides habitat within which insects live. In some cases they eat the organic material, in some cases they eat the biologic film of algae, bacteria, and fungi that form on the surfaces of wood and

leaves underwater. The insects take up nutrients like nitrogen and phosphorus from the water flow to use within their physiologic processes. Eventually most of these nutrients would be excreted back into the water column, although other aquatic organisms may have eaten the insects first, which prolongs the temporary sequestration. Some of the insects will be eaten by terrestrial wildlife, in which case the nutrients will be removed from the water flow. The higher the continual population of aquatic insects, the lower the level of nutrients in the stream flow.

Given the gravity of the water quality problems in Lake Champlain, I think it is important to explore every possible way to achieve improvements. If it turns out that increasing river wood and river insects could contribute to this endeavor, it will lend additional importance to retaining and restoring these components of healthy riparian systems.

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