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LAND MATTERS

Culverts: In Need of Attention

What would you do if on a lovely Saturday morning, your first day in a while away from the demands of your job, your spouse said to you, "Honey, let's go over to Town Hall. Some fellow from the DEC is going to be giving a presentation on culverts?"

I'll tell you what I did. I went. Why, you say? I asked myself that more than once as I drove to the meeting. But I'll tell you something else: it was one of the most interesting presentations I've heard in a while. And it's information that every local political leader, every highway and public works department head, and every member of a Planning Board or Conservation Advisory Commission should be aware of. Indeed, anyone who is interested in the efficient use of public dollars, in our communities' ability to withstand extreme weather events or in the health of our ecosystem will find the subject of culverts a lot more compelling than you might first imagine.

The program, which was sponsored by the Taghkanic Conservation Advisory Committee, was presented by Andrew Meyer, who is with the Hudson River Estuary Program of the New York State Department of Environmental Conservation. The Estuary Program works to protect and improve the health of the Hudson River and its watershed, *i.e.*, all of the land south of the Troy dam from which surface water runoff drains into the Hudson River. That includes almost all of Columbia County. An important focus of that work is improving water quality, and a part of that, in turn, is to look at storm water runoff. For the past couple of years the Estuary Program has been conducting a study of culverts in parts of the watershed and analyzing their impact on storm water runoff, on the ecosystem and, more generally, on our communities.

What's a Culvert?

Merriam-Webster defines a "culvert" very simply as "a transverse drain." There must be several thousand of them throughout Columbia County, and tens of thousands throughout the Hudson River watershed. At every place that a highway, street, farm road, sidewalk, or foot path crosses a stream, including an occasional or intermittent stream, there is likely to be a culvert to carry the water under the road or pathway, to keep the route of travel clear and dry.

Why Are They Important?

I gained an interesting perspective on culverts at the program. We humans create them in order to keep our highways and pathways clear

COLUMBIA LAND CONSERVANCY

and passable. They are critical components of the physical infrastructure of human society that channel massive volumes of surface water runoff, leading ultimately, in our case, to the Hudson River and the ocean beyond. But when you think about it, stream beds – whether they are vigorous year-round streams or occasional streams – serve as highways and pathways for all kinds of creatures. Aquatic creatures, to be sure, but many terrestrial critters also rely upon stream beds to get from place to place.

So what we have is two intersecting, complex networks of highways and pathways. We do our

best to keep ours clear. But very frequently, what eases our means of getting around creates a barrier to the creatures that depend on these waterways for their routes of transport. Moreover, if our culverts are not very well designed or maintained, if they are inadequately sized or positioned in such a way as to be vulnerable in a heavy flooding event, we run the risk of road washouts, which can be very expensive to fix, or flooding, which can cause a lot of damage.

What's the Problem?

The problem then is both ecological and economic. From an ecological perspective, culverts create barriers, often insurmountable barriers, to the workings of the natural world. Just as dams are known to obstruct salmon attempting to return upstream to spawn, culverts can prevent or seriously complicate the effort of other important species to get where they need to go in the course of their natural life cycle. Two examples cited at the program last week were herrings and the American eel, both of which play an important role in the Hudson River ecosystem. Concerns about the ability of organisms to migrate are heightened by the recognition that plants and animals of every variety are going to have to relocate entirely in coming decades in order to adapt to warming temperatures. For this and other reasons, a well-designed culvert system is thus an important strategy to build resiliency to a changing climate.

The economic problem is easy to understand. The cost of highway design and maintenance is one of the most significant on-going expenses our governments have to cover. Not surprisingly, culverts and similar road crossings (such as bridges) constructed by the State are generally better designed (i.e. among other things, they are larger and have greater capacity, and the State has more money) than culverts and road crossings on County roads, which in turn are generally superior to those on Town roads. And guess which category maintains more miles of roads? Of course, it's the Towns – the entities that operate under the greatest financial stress. So naturally, the imperative to economize leads to less capacious, perhaps less well-engineered culverts which then become more vulnerable to damage if not total destruction in a flooding event. In recently completed surveys that covered large portions of Claverack, Gallatin and Ancram here in Columbia County, the study team concluded that 40 to 45% of the culverts in those towns, respectively, were undersized. Those figures suggest a high level of vulnerability to potentially substantial repair and replacement costs in the event of major storm events, not to mention the associated issues of flooding and access barriers to emergency responders.

Is There a Solution?

Obviously, it is not realistic to think about a wholesale reconstruction or replacement of all the problematic culverts in a given area. But if culverts in need of attention can be catalogued and prioritized, it would seem quite possible to tackle the challenge over a period of time. This is precisely what the Estuary Program's Culvert Prioritization Project is hoping to inspire.

Over the course of the past two seasons they have conducted surveys in 11 sub-watersheds within the larger Hudson River watershed area. They drove every road and took an inventory of every culvert over a certain threshold size, taking measurements and observations to fill out 65 data points for each one. They are assessing both the capacity of the culvert, whether it is capable of handling a reasonably predictable volume of runoff in a storm event, and its "passability," i.e. the extent to which it does or does not act as a barrier to the movement of aquatic and riparian organisms. Their hope is to provide communities with the information necessary to make judgments about which culverts are most urgently in need of attention and the nature of the most suitable improvement to be made. Over time, a municipality could realistically hope to improve the flow of surface water and minimize the risks of wash-outs and overtopping. And at the same time, it could restore the passability of the affected stream corridors to the wildlife that depend upon them for existence.

Conclusion

Wouldn't it be great if a culvert assessment could be done in every town in Columbia County? The study will continue this year. There is no charge. Any community that would like to explore this should be in touch with Andrew Meyer at andrew.meyer@dec.ny.gov. Of course they can only do a limited number in any given year, but hopefully the program will continue and over time we could have a pretty complete roadmap for how our storm water runoff system can be substantially improved. And when it comes time to begin to plan for culvert repairs or restoration, there are a number of sources of grant money for that kind of thing.

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