CHESAPEAKE ENVIRONMENTAL PROTECTION ASSOCIATION, INC.
P.O. Box 117, Galesville, Maryland 20765

NEWSLETTER **Spring 2021**

TRUSTEE'S MESSAGE

By Sally Hornor

2021 Maryland Legislative Update

April 12 will bring us the end of the 2021 state legislative session. Although not all bills may be decided when this newsletter is issued, it is useful to look at some of the proposed legislation that would impact the Chesapeake Bay watershed. Thus far we have seen both wins and losses when we look at environmental bills. It is significant to see that many environmental bills include provisions that would lessen the impact of development on underserved and disadvantaged communities.

SB0414/HB583 **Climate Solutions Now Act of 2021**. Sponsors: Pinsky/Stein. This bill requires reducing greenhouse gas emissions by 60% from 2006 levels by 2030 and requires zero-net gas emission by 2045. Reductions in greenhouse gas emissions would in part be attained by a combination of energy efficient building standards and renewable energy incentives. It also calls for some of the state funds that are spent on climate change, such as tree planting and a shift to zero-emission buses, be spent in urban environmental justice communities. This bill passed the Senate and awaits House approval.

SB227/HB295 **Water Pollution – Stormwater Management Regulations and Watershed Implementation Plans – Review and Update.** Sponsors: Elfreth/Love. This bill requires that the Maryland Dept. of the Environment update their stormwater plans with recent precipitation data every five years. This will help to ensure that stormwater Best Management Practices are scaled for the amount of stormwater they are designed to retain. This bill has passed both the Senate and the House.

HB991 **Natural Resources – Forest Mitigation Banks – Qualified Preservation**. Sponsor: Gilcrest Forest mitigation banks are a tool that permit developers to replace trees removed during development by permanently protecting forested land or by paying for reforestation or afforestation. This bill permits developers to mitigate clearing of forests with the purchase of forests in unthreatened areas rather than retaining or replanting onsite. It also does not prioritize preservation of forests of greater ecological value such as riparian buffers. Environmental groups have opposed this bill on the grounds that there is insufficient information on the role that forest mitigation banks play in maintaining forest cover. This bill has passed the House.

HB314/SB223 **Plastic Bag Reduction Act** Sponsors: Lierman/Augustine. This bill bans plastic bags at checkout and permits areas that charge for paper bags to continue to do so. This bill has passed the House.

HB22/SB195 **Stop PFAS Pollution Act** Sponsors: Love/Elfreth. PFAS are a family of organic compounds that are called "forever chemicals" as they are not decomposed in nature. See winter 2020/2021 CEPA newsletter for a discussion of these compounds. They are widely used in packaging, flame retardants on furniture, and firefighting. This bill would require policies to prevent their spread. It did not make it out of committee, perhaps due to a lack of current understanding of the extent of PFAS contamination.

SB540/HB427 **Federal Clean Water Act – Authority of State Sponsors**: Hershey/Gallion. This bill would prevent Maryland from waiving the Water Quality Certification plan developed in 2018 for the Conowingo Dam that would require Exelon to reduce nitrogen and phosphorus pollution in the amount equal to what had been trapped previously or pay an annual fine of $172 million. This bill did not pass out of committee. Instead, the State reached an agreement with Exelon that continues their license to operate the dam and hydroelectric power grid for the next 50 years. This agreement requires Exelon to pay a total of $200 million that is to be used to remove debris passing over the dam, plant underwater grasses, fund oyster and mussel restoration, improve fish passage and study the sediment buildup behind the dam. There is no requirement to reduce nutrients flowing over the dam.

HB843 **Haul Seine Bill Sponsor**: Howard. Permits use of large seine nets for fishing in rivers of Anne Arundel County and the Bay. Although gizzard shad are targeted, other fish such as yellow and white perch would be caught. Gizzard shad are important filter feeders in our rivers and, if caught, would be sold for 5 cents/lb as bait fish. Did not pass out of committee.

If you are interested in seeing the final resolution of these as yet undecided bills, you can check at the Maryland League of Conservation Voters Hotlist (mdlcv.org) or the Maryland General Assembly website (mgaleg.maryland.gov); these sites were used as references for this article. The session ends April 12.

IN THIS ISSUE

CEPA BOARD OF TRUSTEES

Albert Tucker, President
Sally Hornor, Vice-President
Lloyd Lewis, Secretary
Jeff Short, Treasurer

Gary Antonides	Paul Christiansen	Jerry Hill
Anson (Tuck) Hines	Mike Lofton	Scott Knoche
Joan Turek	William Vosburgh	

AA COUNTY PLAN2040 (General Development Plan)
By Mike Lofton

The Time to Speak Up is Almost Over!

The General Development Plan (GDP) or Plan2040 is the County's plan to guide land use for the next 20 years. All master plans and development regulations adopted by the County must be consistent with the goals, policies and recommendations of the GDP. Links to the Draft GDP and related documents are below.

The draft plan being considered by the County Council includes a proposed land use map and approximately 300 parcel specific land use changes (LUCAs). These changes are a significant first step toward rezoning land and authorizing previously prohibited uses. Take a look at the map to see potential changes that may affect your quality of life. Growth Action Network has created a video tutorial to demonstrate use of the map and methods for advocacy.

Link to Map:
https://gis.aacounty.org/portal/apps/webappviewer/index.html?id=46c652cd866647a7b545f2c073491899

Growth Action Network map and advocacy tutorial:
https://vimeo.com/514784616

A list and description of proposed changes can be found at:
https://www.aacounty.org/AACoOIT/PZ/Plan2040-Vol2-Final-Draft-color.pdf (begin on page 268)

The function of the land use map is unclear. Under prior practice, it would be adopted immediately *prior* to the commencement of comprehensive rezoning and would be based on the work of citizen led Regional Plans (previously called Small Area Plans). In the current GDP update the order is different. The GDP and companion land use map will be adopted years prior to the adoption of Regional Plans and rezoning. There appears to be confusion on the Council about the function of the map/lucas prior to the comprehensive rezoning exercise as well as its consequence in administrative decisions.

Here is the audio of the March 11, 2021 Council work session: (begin at 3:00min to 45min).
https://www.aacounty.org/AACoOIT/cc-audio/20210311.m4a

The Md Dept of Planning review of draft Plan2040 does not identify a Land use map as a required element of the Plan;
https://planning.maryland.gov/Documents/OurWork/compplans/20_CMT_AnneArundel.pdf

There are many questions regarding Plan204, such as:

- How will future Administrations and Councils regard the map and its multitude of changes?
- Will the sheer volume of lucas lead to a reliance on "councilmanic courtesy" adoption?
- Should map adoption be deferred and considered as a component of each regional plan?
- At a minimum, should the Council insert strong specific language declaring the map to be invalid as a basis for zoning changes or administrative decisions?

April 19, 2021 is final opportunity to amend the GDP.

Links to the Plan and related subjects;
https://www.aacounty.org/departments/planning-and-zoning/long-range-planning/general-development-plan/index.html

BIDEN'S REVERSAL OF TRUMP'S ENVIRONMETAL ACTIONS
By Gary Antonides

The Washington Post is tracking the environmental actions that the Trump administration took while in office and those that the Biden administration has reversed or hopes to reverse as well as new environmental protections. As of 26 March, of the 216 Trump environmental rollbacks being tracked, 22 have already been overturned, 71 more are "targeted" and 128 are "not yet targeted." Also, as of March 26, 19 new protections have been added. (https://www.washingtonpost.com/graphics/2021/climate-environment/biden-climate-environment-actions/, By Juliet Eilperin, Brady Dennis and John Muyskens).

The purpose of this article is not to discuss the specifics of the issues involved, but just to indicate the magnitude of the task as well as the magnitude of the environmental damage that is at stake. This can be appreciated just by looking at the different categories of Trump's rollbacks:

- Air Pollution and Greenhouse Gases
- Chemical Safety
- Drilling and Extraction
- Infrastructure and Permitting
- Accountability
- Water Pollution
- Wildlife

Under just one of those categories, the one most relevant to the Bay, Water Pollution, there were rollbacks in the following areas:

- Coal Ash
- PFAS substances
- Perchlorate
- Cleanup Requirements for Industry
- Groundwater Pollution from Uranium Mines
- Power Plant Wastewater
- Clean Water Rule on Federal Projects
- Protection for Streams and Wetlands
- Mining Pollution of Streams

Some of Trump's actions will be fairly easy to change, but others will be difficult. The Post categorizes the changes as:

Easy to overturn – Can be reversed by a single act, such as signing an executive order or new directive.

Medium – Can be reversed only through a more extensive action, such as rewriting a regulation or a court ruling.

Difficult – Can only be reversed through a lengthy legislative process, act of Congress or court ruling.

Anyone interested in details of any of these issues is encouraged to check the Post website given above.

ASSISTED MIGRATION

By Gary Antonides

As the climate changes, both plant and animal species attempt to adapt to the changes. In many cases, it means moving habitats north or to higher altitudes. If the climate changes are gradual, most species can adapt or migrate to more suitable areas. But if the climate changes too fast, many species could disappear. In order to help some species migrate, biologists are planting seeds or seedlings further north (or at different altitudes) than their present range.

In the article https://depts.washington.edu/oldenlab/assisted-migration-good-idea-or-misguided-hope/#:~:text=Assisted%20migration%20(also%20known%20as,in%20response%20to%20climate%20change, Molly Payne, Nov 27, 2017, Freshwater Ecology Conservation Lab wrote "*Assisted migration: Good idea or misguided hope?*" and offered some examples.

The conifer tree *Torreya taxifolia* once grew in abundance in ravines along the Apalachicola River on the Florida panhandle. After decades of decline, the species is now considered critically endangered according to the International Union for Conservation of Nature (IUCN). In a last-ditch effort to save the species from extinction, a group known as the Torreya Guardians translocated saplings far northward to an area in North Carolina where it had never previously existed.

This seems to be preserving the Florida *Torreya*, but it raises the question of whether or not human assisted introductions

Photo by Torreya Guardians

of species for conservation purposes are justified despite potential risks of collateral damage. This intentional movement of organisms from current areas of occupancy to locations where the probability of future persistence is predicted to be higher is known as *assisted migration*, and it has come under fierce debate. It's a relatively new concept, born of the perceived need to prevent the extinction of species unable to move or adapt fast enough in response to climate change.

In a different case, a team of researchers transplanted the marbled white butterfly (pictured) to an area north of its native range in England. The butterfly was able to successfully establish a reproducing population without having a negative impact on the native biological community. The researchers cite similarities between the inhabitants of the recipient ecosystem and the inhabitants of the butterfly's native range as the reason for successful integration. In this example, the butterfly was preserved and it did not appear to harm the recipient community.

But many in the scientific community argue that there is considerable uncertainty and risk involved in transplanting a novel species to an unfamiliar and new location. It is difficult to predict how an introduced species will interact with a new community, or what unforeseeable parasites and pathogens it may carry. Further, lagged responses are possible, where an introduced species does not cause damage until several decades later, when it is too late to reconsider translocation.

As an example of a bad outcome, the watercress darter is an endangered fish species that was translocated to a spring outside of its native range, where it successfully established a reproducing population. Unfortunately, unexpected and devastating competition by the watercress darter led to the extinction of the native rush darter just a few years later.

So the scientific community is still unclear on whether to support or abandon the concept of assisted migration. It is a conservation strategy for which there are documented examples of success, but many examples of the dangers of species introduction. There are other options to reducing a species' risk of extinction, including increasing habitat connectivity to allow species to gradually migrate themselves, and reducing habitat loss and extinction rates. But, in some cases, if these are impractical or unsuccessful, it may be decided to utilize assisted migration.

Assisted Migration of Forests

Even though we sited two examples where assisted migration was used for animal life, plant life is naturally more endangered by climate change than animal life due to its lack of mobility. For many reasons, including carbon sequestration, wildlife habitat, mitigating runoff, and supporting the lumber industry, forests have gotten considerable attention with regard to assisted migration.

Some of these efforts are discussed in https://www.fs.usda.gov/ccrc/topics/assisted-migration, by Stephen Handler, et al., US Forest Service Northern Research Station, Houghton, MI. The rest of this article is based on this report.

Recent research has demonstrated that, indeed, many tree species are already undergoing distribution shifts in response to climate change, with different studies highlighting species that are moving poleward and higher in elevation, or moving east-west to track changes in moisture availability.

Many factors can complicate species movement across a fragmented landscape, however, so changes we expect from climate change may be hard to observe. Research on Douglas-fir and ponderosa pine indicates that different genetic subspecies may have different responses to climate change and different levels of vulnerability. Other causes besides climate change that have contributed to tree species movement in the eastern US are ecosystem succession following intensive logging, human land-use changes, and wildfire suppression.

Based on observed and projected rates of climate change, there is an expectation that some important species will not be able to migrate quickly enough. Natural migration over long distances requires several generations because trees require several years to get to reproduction age. Recent estimates indicate that post-glacial migration rates for many tree species were 100 to 500 meters per year. Recent rates of climate change for large areas of the Midwest, Great Plains, Southeast, and isolated locations in the western US have been from 1,000 to 10,000 meters per year.

For species with very specific habitat needs or ranges limited by physical barriers, such as fragmentation or geographic features, the entire species could be at risk of extinction due to climate change.

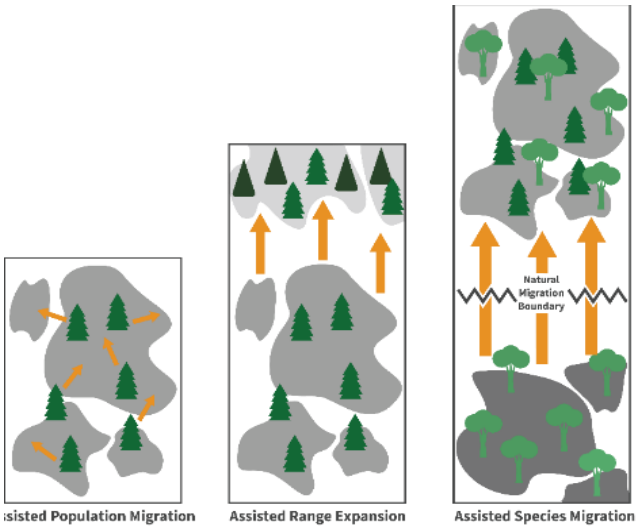
Two examples where assisted migration was successful:

(1) Transplant studies of white spruce in Quebec suggested that southern seed sources might be used in northern locations.
(2) Trials with whitebark pine demonstrated that seeds can be successfully germinated and grown large distances (500 miles) to the north of the current species range boundary. Seed sources from Oregon and Washington performed well in northwestern British Columbia.

Even if large populations are not planted in new areas, if small populations can survive beyond existing ranges, they may contribute genetic characteristics associated with warmer climates to native populations giving the native populations a better chance to adapt through natural selection.

Assisted migration falls into three categories:

- **Assisted population migration** (also assisted genetic migration) – moving seed sources or populations to new locations *within the historical species range*
- **Assisted range expansion** – moving seed sources or populations from their current range to suitable areas *just beyond the historical species range*
- **Assisted species migration** (assisted long-distance migration) – moving seed sources or populations to a location *far outside the historical species range and beyond locations accessible by natural dispersal.*



Assisted migration may be motivated by a variety of different goals. Clearly articulated goals will help determine which kinds of assisted migration actions are most suitable and also help evaluate the benefits and risks. Possible goals are:

- maintaining or enhancing genetic diversity within a population
- protecting a species or population from extinction
- mimicking natural dispersal interrupted by human habitat barriers
- maintaining ecosystem functions
- enhancing the productivity of a commercially valuable species.

New tools exist to help foresters decide when and where to use assisted migration, namely the Forest Service's Climate Change Tree Atlas for species-level considerations and the Seedlot Selection Tool.

In some cases, assisted migration will directly conflict with established conservation principles and existing agency policy (e.g. Forest Service seed transfer zones). But it might be clear

that climate change and other factors make the risk of doing nothing greater than the risk of intervening.

Some of the important considerations associated with assisted migration include:

- Newly introduced species may become invasive
- Newly introduced species may hybridize with local species, such as with different types of spruce, pine, poplar, and oak
- Species introductions may unknowingly introduce pests or diseases into new areas, particularly with longer transfer distances
- Long-distance transfers based on projected climate conditions at the end of the century raise the likelihood that *current* habitat may not yet be suitable.
- Some species have smaller climatic transfer limits than others. For example, Douglas-fir and lodgepole pine have smaller transfer limits than eastern white pine
- Appropriate seed sources in sufficient quantities may not be available for species with limited ranges or for species that are not commercially utilized
- Factors other than climate, such as soil type, moisture regime, animal feeding, competition, pests and pathogens may preclude successful establishment
- If assisted migration is used to establish a species in many different locations with a range of conditions, it reduces risk from uncertain climate impacts

Current Applications

The movement of species and populations has been practiced before, for various reasons, but doing so as a climate change adaptation strategy is fairly new, although it already seems to be fairly common, at least for purposes of conducting trials.

The Assisted Migration Adaptation Trial (AMAT), led by the British Columbia Ministry of Forests, Lands, Natural Resource Operations, and Rural Development working with the USDA Forest Service, timber companies, and other partners, is a long-term research project that is testing climate tolerances of different seedlots across a broad territory from northern California to the southern Yukon. See: (https://www2.gov.bc.ca/gov/content/industry/forestry/managing-our-forest-resources/tree-seed/forest-genetics/seed-transfer-climate-change/assisted-migration-adaptation-trial). Researchers are testing the growth and health of seedlings from 15 different species, including ponderosa pine, lodgepole pine, western larch, yellow cedar, and Douglas-fir. Information from this project will be used to revise tree species and seed source selection guidelines for British Columbia.

The Adaptive Silviculture for Climate Change (ASCC) project, as the name indicates, involves assisted migration specifically for climate adaptation. (www.adaptivesilviculture.org). ASCC study locations around the country are designed to represent a range of climate adaptation pathways. For example, at the ASCC study location on the Cutfoot Experimental Forest on the Chippewa National Forest in northern Minnesota, the assisted migration study includes white oak, bitternut hickory, and ponderosa pine. These species movements represent movements of dozens of miles to hundreds of miles outside the natural range of these species.

Along with projects like AMAT and ASCC, which explore species-level assisted migration, many past and on-going research exists that examine questions of genetic variation within species and the effects of climatic transfer on their growth and survival. For example, a large lodgepole pine project in British Columbia involving 140 distinct populations and 62 planting sites was able to establish a reliable basis for predicting the influence of climate on different lodgepole seed sources. In addition, there was a Douglas-fir Seed Source Movement Trial in Oregon and Washington that revealed within-species differences in drought tolerance and cold hardiness. More information is forthcoming.

In the 2012 report *Genetic Resource Management and Climate Change: Genetic Options for Adapting National Forests to Climate Change,* the USDA Forest Service recommended that large scale population transfers to match seed sources to projected future conditions be done only for species where experience or research has demonstrated appropriate climate transfer limits. The authors of this report also discourage basing assisted migration decisions on projections of climate conditions at the end of the century, but they advocate for using a 20-year time frame as the basis for setting suitable transfer distances. This would tend to reduce risk of mismatches between seedlings moved from warmer to colder climates.

National Forests are able to request permission to introduce novel species for assisted migration with longer transfer distances, but these actions are primarily permitted for limited research purposes.

Similarly, the Canadian Forest Service and Provincial forestry departments in Canada are encouraging limited use of assisted migration as a climate change adaptation practice. British Columbia began allowing seed transfers to higher altitudes in 2008, and formally amended the *Chief Forester's Standards for Seed Use* policy in 2018 to allow for climate-based seed transfer. Alberta, Ontario, and Quebec currently allow seed zone exceptions with appropriate review.

In addition to these large-scale studies, many foresters and land managers are exploring assisted migration on their own. They are establishing many pilot-scale projects that involve some degree of assisted migration. For example, Providence Water is responsible for managing 13,000 acres of forested pubic land surrounding the state of Rhode Island's major freshwater reservoirs. For over a century, they have been maintaining a forest that is resilient to disturbances that could negatively impact water quality. Many northern species in this property will face increasing stress from climate change, so Providence Water is experimenting with assisted migration as a climate adaptation practice, planting southerly species such as black oak, black locust, persimmon, sweetgum, and others. These kinds of examples from early adopters will contribute valuable information.

PROFILE OF A TRUSTEE

Dr. C. Paul Christensen

CEPA is pleased to welcome Dr. Paul Christiansen as a new Trustee. He grew up in Southern Colorado and attended Colorado State University for his BS degree in Electrical Engineering. He received his MS in Electronic Engineering from Massachusetts Institute of Technology, where he began his interest in laser technology. After leaving MIT and working in microwave engineering at Hewlett-Packard he attended UC Berkeley, where he studied laser technology and received his PhD in Electronic Engineering.

Paul spent six years on the research faculty at the University of Southern California before coming to the Washington area to manage a laser and plasma research program for the National Science Foundation. Upon completion of his NSF appointment, he started a laser equipment and services company, Potomac Photonics, Inc., in the basement of his small home in Alexandria, VA. After 17 years of hard work, the company had grown to 30 employees and was sold to a group of investors in 1999. It is now located in Baltimore and continues to provide laser microfabrication services to a wide range of international customers. Sale of the company allowed him to pursue long-deferred dreams of sailing, skiing, and backpacking, and he spent much of his time in these activities for about 5 years. He then started a small contract R&D company, Potomac MesoSystems, that specializes in miniaturization technologies, and he continues to be active in the company on a part-time basis.

Paul has lived in Tracys Landing for 27 years and is a Member of the Board of the Growth Action Network (GAN) and is on the Steering Committee of Alliance for Livable Communities. He serves as the newsletter editor and website administrator for both organizations and heads the Communication Committee at GAN. In addition to CEPA he is also a member of Advocates for Herring Bay and Patuxent Riverkeeper. His hobbies include kayaking, hiking, travel, and GIS mapping.

After spending significant portions of his life in both rural and high-density-urban areas, Paul has become increasingly aware of the complex interaction between land use, the environment, population growth and development. He enjoys the opportunity to collaborate with the members of CEPA on local issues related to these topics.

CEPA MEMBERSHIP

A CEPA membership entitles you to receive our newsletter and to vote for our Trustees.

Name_____

Address_____

_____

Phone_____

Email_____

Enclosed is:

[ ] $30. for my CEPA membership

[ ] $50. for my Sponsoring CEPA membership

[ ] $100. for my Sustaining CEPA membership

Newsletters:

[ ] Please send me emails when the newsletters are posted.

[ ] Please send hard copies of the newsletters to me by mail

CEPA
P.O. Box 117
Galesville, MD 20765