STOCKBRIDGE-MUNSEE COMMUNITY Band of Mohicans
MOHICAN NEWS
The people of the waters that are never still
Special Edition | N8480 Moh He Con Nuck Road • Bowler, WI 54416 | June 15, 2023

Stockbridge-Munsee Community Special Edition

Cutting into Year Two

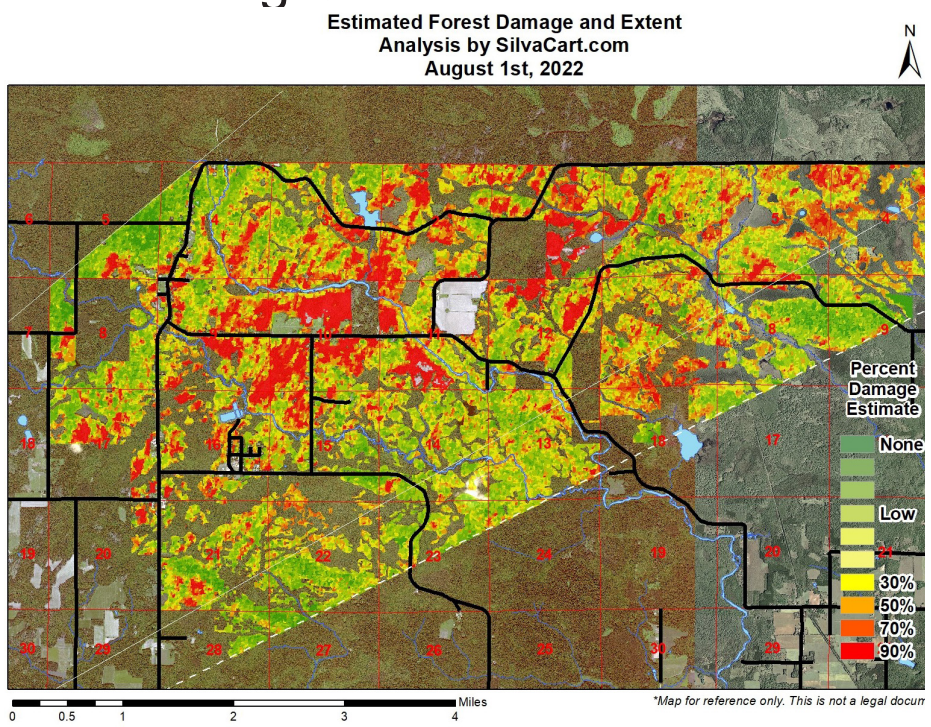
Timber salvaged by Quality Logging and Low Impact Logging Companies working with Tigerton Lumber east of Silver Creek Road

By: Paul Koll, Forest Manager

A year has passed since the storm but we are nowhere near out of the woods. The first year was turbulent as the Tribe's Staff, Committees, and Council worked tirelessly to evaluate, assess, and respond to such a catastrophic event. As the dust cleared, the Tribe was able to find its stride and begin the salvage process. Immediately after the storm, the entire land base was evaluated using aerial photography and ground truthing. Then, a decisive plan of action was formulated, outside funding was secured, and 23 salvage units (log jobs) were defined. Of the 23 units, 21 contracts were awarded, locking in payment rates. The remaining two small units are expected to be awarded by the end of June. In the fall of 2022, seven logging crews began salvaging 10 different units. Six have been completed and the crews are making good progress on the other four. It is estimated that 30% of the salvage was completed within the first twelve months, grossing over $1.9 million for the Tribe.

Cutting cont on pg Three:

Reforesting Our Future



By: Paul Koll, Forest Manager

There is a lot of wonder about what will come from all this storm damage. Currently, we are not in a position to divert our attention from the salvage, as there is a lot of work yet to be done. Still, it is important to begin thinking of the future. The Forestry and Ecology Staff, Forestry Committee, and Council have begun discussions on

Future cont on page Five:

Protecting Wetlands During Storm Cleanup

Example of marked wetland boundary in a timber sale.

By: Mike Jones, Wetland Specialist, SMC Ecology Department

For all the devastation that the 2022 storm brought to the Tribe's upland forests, damage to the forested wetlands was relatively minor. However, if not done responsibly, the subsequent timber salvage

Wetland cont on pg Four:

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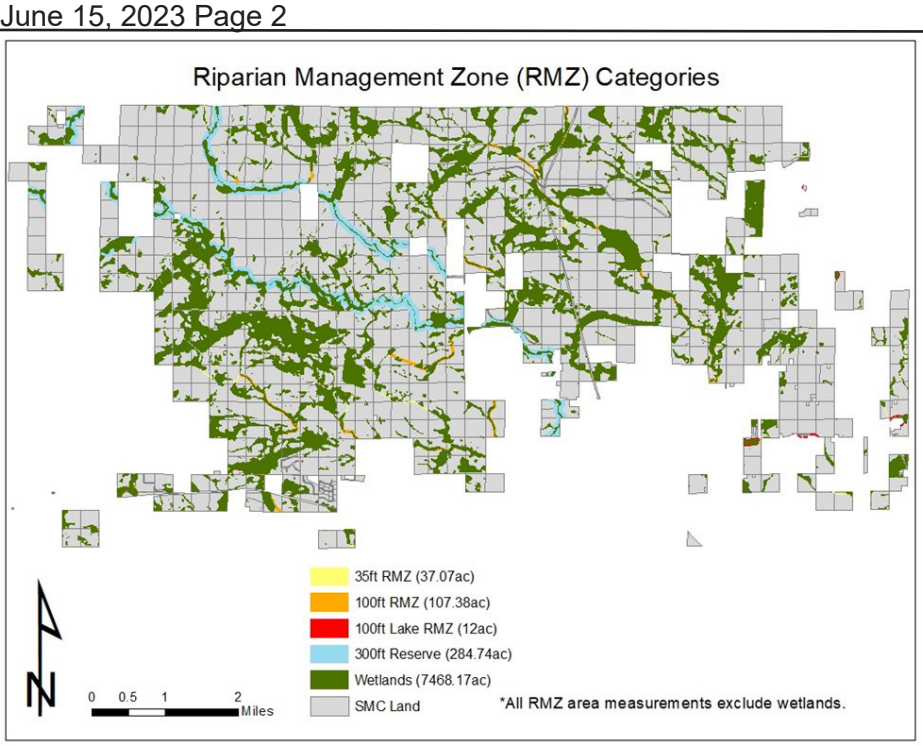
What's Inside?

This Special Edition of the Tornado update is dedicated solely to informing Tribal members of the Forestry progress for the year. Therefore, there will be no advertisements.



June 2022 Storm: Impact to Hydrology

By: Alex Brauer, Tribal Hydrologist

As the Community is aware, the tornado that swept through our area in June of 2022 vastly changed the landscape around us. While most people are quick to notice the tipped and twisted trees it left in its path, some might not think about the impact such destruction has on local hydrology. We are fortunate to live in an area that has many cool water streams and rivers that support a unique community of fish and invertebrates. To preserve these ecosystems, careful consideration must be given to how we manage the lands that support them.

Many impacts to hydrology are caused by a natural disaster like the one we experienced in 2022. The main impact is the potential increase in surface water temperature due to the cumulative increase of sunlight energy hitting the forest floor and stream channels. Combined, these blowdowns could artificially increase the temperature of overland runoff of rainwater feeding streams and wetlands. Many organisms that call these cool water systems home, rely on a supply of cool water to help them survive through the heat of the summer months. As water temperature increases, it loses its ability to hold dissolved oxygen. Because of this, species such as brook trout become stressed as water temperatures increase.

Clean up of these damaged areas can also add an element of stress to these streams. This includes the introduction of new trails and potential stream and wetland crossings. If not done correctly, sediment can runoff into streams filling in habitat for aquatic insects and potential spawning areas for fish.

While the storm impacted a large amount of Tribal lands, not all of the impacts were negative. Coarse woody debris (sticks and logs) were added naturally to our streams and rivers creating habitat for aquatic insects as well as refuge areas for juvenile and adult fish to hide and avoid predation.

Efforts to Reduce Impact

Fortunately, there are things that we can do as land managers to help reduce the negative impacts and preserve our cool water streams and rivers. First and foremost, protect our wetlands. Wetlands serve as a filter and buffer to water running off adjacent uplands. The plant communities that exist in our wetlands are extremely effective at grabbing up excess nutrients and sediment before it reaches the streams. The shading wetlands provide also keep water temperatures lower as snowmelt and rainwater feed our river systems. Wetlands also act as a sponge, absorbing excess water during times when it is plentiful and slowly release it during dry periods. Without healthy wetlands, we would not have healthy streams and rivers.

Hydrology cont on pg 8:

Express your thoughts and opinions. Let your voice be heard.
We welcome your letters to the Editor and the Community.

Community Voices

Letters of opinion can be dropped of at Mohican News in the Tribal Offices or can be mailed to:

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Ryan from RC Logging working with Central Wisconsin Lumber salvaging east of the Anderson Road.

Cutting cont from pg One: This was a major feat that took the cooperation and understanding of the entire Community.

As we roll into year two, the Staff is optimistic. Five logging crews have already resumed harvesting with two more planning to move in by the end of the month. Though it is uncommon to see logging operations during the summer months here on the reservation, the Staff, Committees, and Council felt the most extremely damaged areas needed action. This will ensure timeliness of the cleanup and capture as much value as possible. These crews will only focus on areas requiring clear-cut treatments, since the damage has already been done and there is less risk to wildlife and the residual forest. Salvaging in areas prescribed with select harvesting will then resume on August 1st, a month earlier than our usual logging season. Breeding animals and the spread of tree diseases weighed heavily on these decisions but the Staff, Committee, and Council agreed the unusual circumstances warranted the exceptions. With this extended season and eager logging crews, the Staff is hoping to double the volume that was harvested in the first year. We will push to have the majority of the commercial forest cleaned up by this time next year. This goal is ambitious, but with good weather and the help of dedicated crews, we will be in a good position to prepare for the next phase of the forest.

Natural regeneration in a clear-cut salvage near Lakewood, Wisconsin. The salvage was completed in 2020, cleaning up damage from the 2019 tornado.

2022 Blow down – Impact on Invasive species

Garlic Mustard Rosette (Kingcounty.gov)

The second stage of Garlic Mustard is a plant that is light green in color and can grow up to three feet tall. When flowing, the plant has small white flowers (Figure below).

By Josh Jensen, Water Resource Technician – SMC Ecology Department

On June 15th, 2022 the Reservation had a major natural event which resulted in a massive amount of mature forest being mortally damaged. Most community members are able to visually see the devastation of the lost woods. Where there was once dense canopy cover from a thriving northern hardwood forest there are now large open areas.

These large open areas do not only impact what is immediately visible. With direct sunlight hitting these previously densely shaded areas different plant communities will emerge. These new plant communities though mostly very desirable, may come with some unwanted guests which the community should stay aware of.

The following species are some that may favor the blowdown conditions. There are several others that the Ecology Department works diligently to manage. First, we will start with Garlic Mustard.

Garlic Mustard is a biennial plant. This means that in its first year after sprouting it grows into what is called the rosette (photo above). This rosette is usually

Impact cont on page Six:

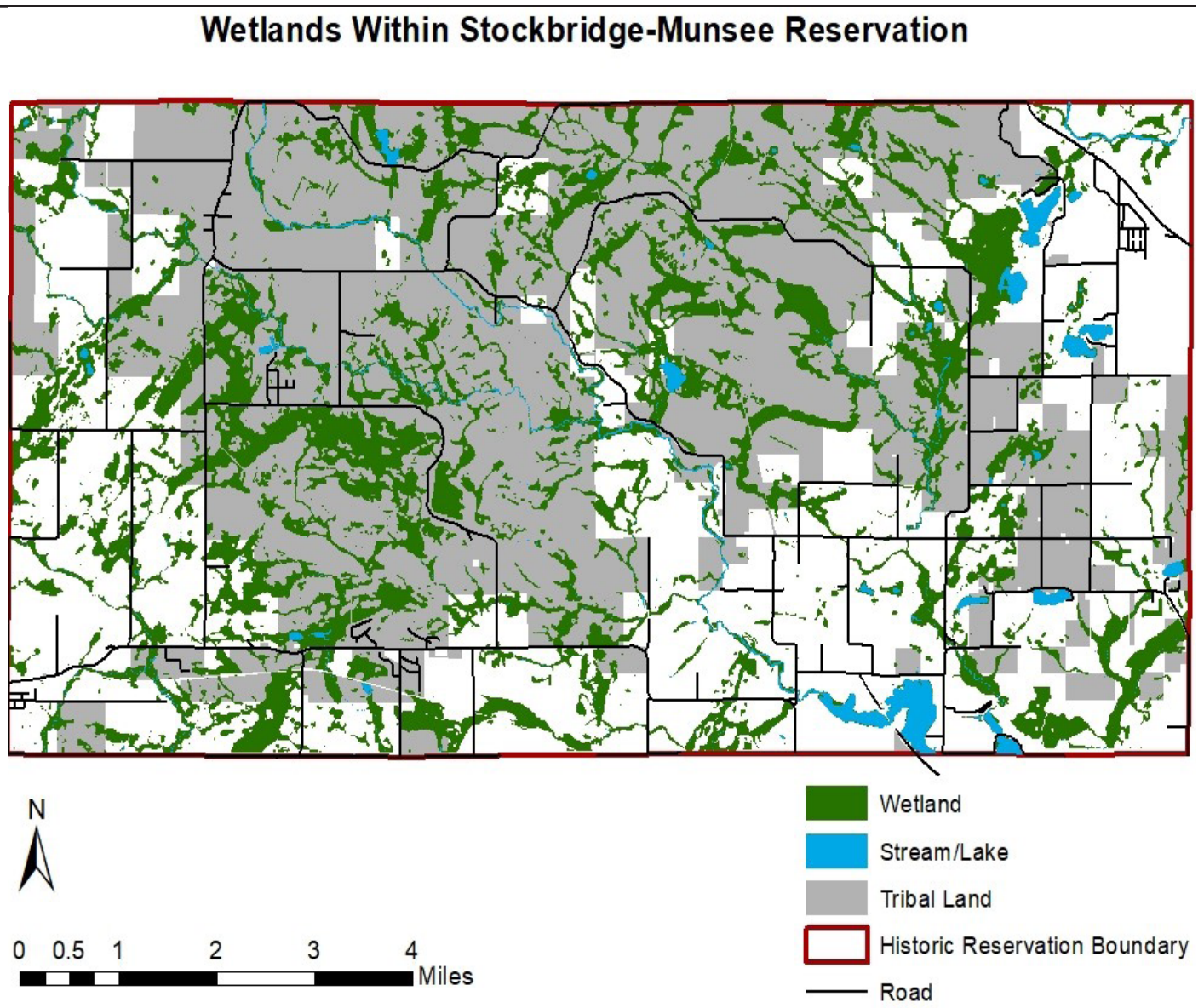
Flowering Garlic Mustard (Kingcounty.gov)

Wetland cont from pg 1:
and cleanup efforts have the potential to harm wetlands as the large, heavy logging equipment enters the woods. The SMC Ecology Department has been actively implementing its standard procedures for protecting wetlands during timber harvest to ensure that any impacts are minimized.

Wetlands are incredibly important ecosystems that provide a wide range of functions, including:

- Fish, wildlife, and plant habitat
- Limiting flood damage by slowing and absorbing excess water and sediment
- Stabilizing shorelines to prevent erosion
- Carbon sequestration, meaning carbon is stored in the soil and plants instead of being released into the atmosphere and contributing to climate change
- Recharging groundwater
- Discharging clean groundwater into streams and lakes
- Filtering pollutants and excess nutrients to prevent groundwater and surface water contamination
- Human subsistence and recreation opportunities, such as hunting, fishing, and gathering

Wetlands make up about a ¼ of the Stockbridge-Munsee Reservation, with the large majority being forested swamps. Fortunately, many of the wetlands on the Reservation are high quality and relatively undisturbed. They play an important role in maintaining the abundance of fish, wildlife, and healthy lakes and streams on SMC lands. The Ecology Department has the responsibility of monitoring and protecting the health of Tribal wetlands to ensure those resources and values continue to benefit the Tribal Community.



Potential Wetland Impacts

Timber harvest and storm cleanup activities are important for forest health, but they do come with some risks to wetlands. Wetlands are often very sensitive systems because they rely on specific hydrologic and soil conditions that allow them to support various plant communities and carry out different functions. If heavy logging equipment operates in a wetland, it can damage or kill sensitive plant and animal species. Rutting and soil compaction can impact how water moves through the soil and across the landscape. If severe, that damage can lead to a change in wetland plant communities or even permanent wetland loss. To this day, there are examples on the Reservation of permanent wetland impacts along old logging trails from the Cut Over in the late 1800's and early 1900s. Disturbed wetlands can also release more greenhouse gases into the atmosphere due to changes in the chemical and microbial processes within the soil.

Wetlands can also be negatively impacted simply by the loss of canopy cover. Less trees means more sunlight reaching the ground, which can alter plant growth, increase water temperature, and reduce the amount of time that the wetland has standing water (known as hydroperiod). Many of the Tribal wetlands are headwaters to cool water trout streams so it is important to keep them shaded to reduce temperature increases. Disturbances can also promote colonization by invasive species, which can reduce biodiversity and wetland resilience. However, storm events are a natural disturbance so most healthy wetlands can handle the short-term effects of canopy loss.

Wetland Protection During Harvest

To implement wetland protection measures during storm cleanup activities, Ecology Department Staff start with delineating wetland boundaries within each timber sale prior to harvest. Trees along the wetland edge are marked with two stripes of blue tree paint ("double-bar blue"). This helps Forestry Department Staff, BIA Staff, and logging crews easily identify the wetlands so trees can be marked and responsibly harvested. In rare cases, additional no-cut buffers are added along certain wetlands or on forested land connecting wetlands. Ecology Department Staff consider the wetland type, the level of cutting that will occur (e.g., clear-cut, light thinning), and the direction the wetland edge is facing to determine if buffers are necessary. These buffers can be used to protect wildlife travel corridors, or to limit the effects of shade loss. For example,

Wetland cont on page 7

Tour lead by WDNR's Richard Lietz exploring site preparation and planting efforts from the 2019 tornado. Though ample natural hardwood regeneration was common across the region, extensive effort was needed to convert sites, like this one, to pine.

Future cont from pg One: the development of a plan. Everyone agrees that re-establishment of a diverse forest is priority.

The Tribe's northern hardwood and hemlock forests have evolved with wind disturbance as the most common damaging factor, and the forest is adapted to regenerate naturally in its wake. In fact, conventional management prescriptions try to mimic wind events across forest types. Selection harvests, like most of the logging harvests in our commercial forest, try to create conditions like those common from small scale wind events, removing individual or small pockets of trees. These openings, or gaps, allow sunlight to reach the forest floor providing an environment conducive for a new cohort of seedlings to germinate and establish. The size and extent of the disturbance often dictates which species will gain the competitive advantage and have a chance to reach the canopy. Small gaps often close quickly and promote shade tolerant trees like sugar maple, hemlock, and yellow birch. Larger openings allow for sunlight to penetrate longer, promoting moderately shade tolerant species like red oak, bitternut hickory, and white ash. This method of selective tree removal is the basis for all-aged forest management and is the backbone of the Tribe's forest management strategy. All-aged management strives to have individuals of different ages, sizes, shade tolerances, and species all growing together, theoretically providing the opportunity to harvest a portion of the individuals on rotation for perpetuity. These stable systems are also considered late successional or climax ecosystems since they are adapted to persist until a catastrophic event resets them.

Alternately, species like aspen, cherry, and paper birch need full sunlight to prosper. Small openings don't create conditions suitable for these early successional shade intolerant species. However, wind events can vary greatly in the damage they inflict. Tornados and derechos can cause catastrophic stand damage that leaves very few trees standing. These large open areas create an environment for these shade intolerant species to prosper and recolonize the site. Again, conventional forest management mimics these types of events to promote early successional cover types. Even-aged management methods, like clear-cutting or seed tree, promote species like aspen and paper birch and are the only viable method to keep these ecosystems on the landscape. In these systems, all the individuals in the stand originated from the same time period, hence even-aged. These ecosystems can be maintained in this successional state by periodically harvesting the entire stand or can be converted into all-aged stands by encouraging intolerant and tolerant species, if desired.

The Tribe uses both even-aged and all-aged management strategies to keep a diverse forest and they are all based on mimicking mother nature. Often though, we think of these strategies as how to harvest trees, in actuality, they are rooted in how to regenerate desired species and communities naturally. Much of the damage from last year's storm was scattered and the salvaging strategy resulted, or will result, in a thinned forest, much like a conventional selection harvest. In these areas, where sunlight can now reach the forest floor, seedlings should establish through natural regeneration. However, same areas experienced damage at a more catastrophic level, resetting the system. These areas, nearly a quarter of the damage, will need to start over. As stated earlier, this is the natural process the forest has evolved to handle catastrophic events. Stump sprouts from damaged trees, coppice sprouts from extensive underground root systems, and seeds both fresh and those waiting in the seedbank for an opportunity, should recolonize these sites. Clear-cutting these sites to remove the large woody debris should help speed up this process by creating a more inviting environment for seedling establishment. Mother Nature has very effective strategies for reforestation.

For a little historical perspective, the forest that covers the reservation, and the majority of the Midwest for that matter, is young, originating in the early 1900's following the Cut Over. The devastating Cut Over from the turn of the last century, removed nearly every tree from the landscape, leaving an environment one can barely imagine. But, the forest rebounded and recovered. Early successional species recolonized the land, creating environments that helped reestablish the mid and later successional

Future cont on page Six:

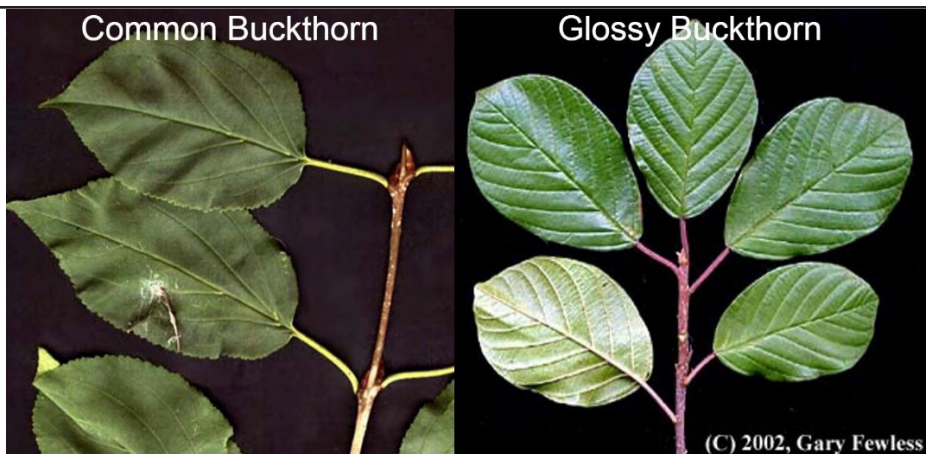
Clear-cut in heavy storm damage completed by RC Logging west of Anderson Road.

Natural regeneration originating from a wind damaged stand north of Anderson Road.

Future cont from Five: species. The forest we know and see today came from massive clear-cuts, far more extreme than what we are dealing with today. These trees all established from natural regeneration methods, without human intervention. Mother Nature's ability to heal herself is utterly amazing.

All of these thoughts are helping to drive the Tribe's planning process to quickly and efficiently reforest the areas that were lost. In the forefront, we are confident that natural regeneration will start the process, but, unlike historically, there are some new stressors that the previous forest didn't have to deal with. Deer populations are far higher than ever before and can have devastating effects on tree seedlings. Second, these disturbed sites and sunny areas are perfect for the invasion of non-native species. Finally, the climate is changing and weather is becoming more extreme; storms, temperature spikes, and droughts.

Only time will tell how well these sites will repopulate, but we have various tools and tactics to combat new challenges. The Staff will continuously evaluate the progress, and as needs arise, step in to help. The plan will be adaptive and focus on responding to the varying conditions. The plan will also be strategic: striving for efficiency and effectiveness. Staff will evaluate the number and species of seedlings colonizing these sites. If insufficient numbers are found, site preparation, supplemental seeding, or planting may be warranted. Similarly, if there is a lack of desired species, supplemental seeding or planting may be warranted to add specific species. If excessive competition is hindering development, treatment of invasive species may be needed. Furthermore, the Staff will continue to watch the WDNR and the US Forest Service as they work to reforest the Lakewood/ Laona area devastated by a similar 2019 tornado. Further down the road as seedlings establish, plans will be developed to determine the desired future condition. The Tribe may want to designate areas to keep in even-aged early successional stages and others to actively promote longer lived species. Precommercial thinnings to develop and massage these stands into the desired forest types is expected to be the focus of the Staff for many years to come. A silver lining from this tragic event may be the Tribe's ability to manage these "new" stands from their inception, providing ample opportunities to coax, or even create, an even healthier and more resilient forest than the one that was lost. The process may seem slow but the opportunities look very bright.



Buckthorn Leaf Comparison (wisflora.botany.wisc.edu)

Impact cont from pg 3: shorter and darker in color and does not flower. This stage is used to grow the roots and store up energy to produce massive amounts of seeds for the following summer.

The issue with Garlic Mustard is that it has very viable seeds that can stay dormant in the soil for years before emerging. They are an aggressive spreader that can quickly displace native vegetation and can severely throw of the balance of local ecosystems. It tolerates shade very well which is why it poses a great threat to the Reservation. This plant is connected to the blowdown because the seeds spread very easily in treads of tires from recreational vehicles and woods equipment, soil that is clinging to the side of the vehicles and equipment, and even in the treads of foot wear.

The next invasive to watch out for is Buckthorn. There are two species, Glossy and Common. Glossy Buckthorn is more prevalent on the Reservation and is noted to be much worse of a problem locally than Common Buckthorn. There are identifying differences in the intermediate bark and the leaves. In the picture above and the picture below you can see comparisons of both. Glossy Buckthorn is easily mistaken for Black Cherry if just using bark identification alone.

These shrubs pose a threat to the ecology of the Reservation because they are quick to move into disturbed areas that receive adequate sunlight. This means the storm damage areas are highly susceptible to an invasion of these shrubby trees. The seeds are highly viable, and are often spread by wildlife that can safely consume

Impact cont on page 7:

Buckthorn Comparison to Black Cherry (wisflora.botany.wisc.edu)

Example of ephemeral pond during spring (left) and summer (right). Source: Vernal Pool Association

Wetland cont from page 4:
wetlands with large amounts of sphagnum moss are especially susceptible to drying so the south-facing edge may be buffered to maintain shading.

Wetland crossings may also be required to allow access to harvest units. If necessary, Ecology Department Staff work with the Tribal Forester or BIA Forester to identify the best location and practices to allow equipment to cross without long-term wetland damage. When harvest is complete, staff inspect any wetland boundaries or crossings to make sure no damage occurred.

While most of the procedures have been consistent with what is typically implemented during timber harvest, the unique circumstances from this storm have led to a few modifications. The biggest change is the timing of harvest and number of clear-cuts. Harvest normally occurs in the late fall and winter, and frozen conditions help minimize some of the potential wetland impacts. During salvage efforts, clear-cuts will be occurring throughout the summer and select cutting will start earlier in the year. Because of this, wetland marking has been done a little more conservatively to avoid issues during times of high water tables and to account for major impacts to wetland shading.

Wetland Mapping Update

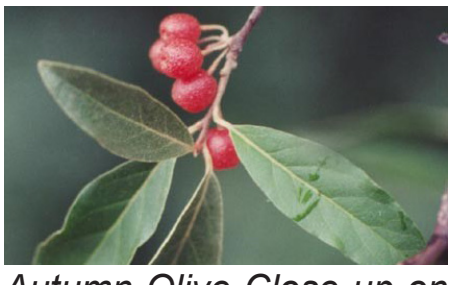
Prior to the storm, the Ecology Dept. received an Environmental Protection Agency (EPA) Wetland Program Development Grant focused on updating the Tribe's wetland inventory. The wetland mapping effort utilized more sophisticated techniques and higher resolution aerial imagery and elevation data to more accurately map wetlands throughout the Reservation. The Ecology and Forestry Departments have been able to use the improved maps to better plan the timber harvests and improve efficiency of delineations.

In addition to the inventory update, depressions in the landscape were analyzed to identify potential ephemeral ponds (PEPs) on the Reservation. Ephemeral ponds are small, isolated wetlands that typically dry up by mid-summer. They serve as critical breeding habitat for several amphibian species and are highly vulnerable to degradation. Ephemeral ponds are easily missed during normal wetland mapping, so verifying locations will help ensure these important systems are protected during logging. Ecology Department Staff has been visiting PEPs to determine if they are actually ephemeral ponds, then including verified ponds in pre-harvest wetland maps.

Autumn Olive Mature Shrub (www.nature.org)

Impact cont from pg 6:
the fruit. This same wildlife are drawn to field edges where sightlines are vast and there are adequate areas for perching.

Next on our list (photo above) is Autumn Olive. Like the previous invasive, Autumn Olive is a very vigorous plant that can grow up to 20ft tall and have a 30ft wide canopy. This shrub favors disturbed open areas. Autumn olive is a problem because it outcompetes and displaces native plants. It does this by shading them out and by changing the chemistry of the soil around it, a process called allelopathy. Autumn Olive spreads through the abundant fruit that it produces. The leaves are narrow and the fruit looks like a red berry. Both leaf and berry have silvery scale which help set them apart (photo below) from other shrubs. This invasive is of special concern in the storm damage areas since it is one invasive that is most likely to favor the freshly open areas and establish large populations quickly.



Autumn Olive Close up on Leaf and Fruit (www.nature.org)

While Invasive plants may be foreshadowed by the magnitude of timber damage. They are still an important factor while the community cleans up after the storm, even years later. Staying vigilant ensures a healthy ecological system moving forward as the forest heals. Community members are encouraged to inform the Ecology Department if they see anything that may look concerning. That being said, the invasive plants listed above are a few that are especially concerning in the storm damage areas, but is not an exhaustive list. For those interested in more information on plants to keep an eye out for throughout the Reservation, please contact the Ecology Department at 1-715-793-4818.

Post-harvest wetland boundary.

Hydrology cont from 2:
The SMC Ecology Department protects wetlands by performing a delineation prior to any forestry activities. This involves painting a border that logging operators are not allowed to cross. Care is taken along south facing wetlands to ensure that enough shading is left to keep the plant community healthy and water temperatures low.

The Ecology Department also works with the SMC Forestry Department to set up what are called riparian management zones (RMZs). These are areas around streams and rivers that additional best management practices (BMPs) are used to preserve shading, reduce erosion, and promote a beneficial plant community. The width of the RMZ is directly related to the size of the river or stream it is protecting. A RMZ ranges in size from 35 to 300 feet (see map on page Eight).

In areas that are not accessible to perform clean up without crossing a wetland or a stream, Ecology and Forestry Department Staff evaluate the site and choose the best location based on the streambank or wetland substrate and slope of adjacent land. Different types of crossings are used for different situations, but the most common practice is to lay down slash (tree tops) during frozen conditions. The slash helps distribute the weight of logging equipment as it drives across, while allowing water to flow unimpeded. Once the timber sale is complete, the slash is removed and the stream or wetland is allowed to return to its natural condition.

Once a forestry operation is completed, SMC Ecology Department Staff perform a post-harvest evaluation to ensure that all BMPs were followed. If a violation is found, such as excessive rutting or a boundary that was crossed, the hired logging operation has to fix the damage or remediate the issue prior to the Tribe returning their performance bond.

Monitoring
The SMC Ecology Department runs an Environmental Protection Agency (EPA) Clean Water grant that funds monitoring of Tribal surface water quality. Long-term monitoring has been done on main rivers and streams that flow through Tribal land since at least 2012. In fact, continuous temperature and flow data has been recorded on the Red River dating back to 1992. All sites monitored include weekly measurements of temperature, dissolved oxygen, total phosphorus, bacteria, total suspended solids, among others. Substrate size, habitat assessments, and fish and insect community assessments are also completed on an annual basis. These collections of data can help determine any short or long-term impact from the tornado or the cleanup operations, as well as any changes in the environment that are unrelated to the storm damage. If issues to water quality are discovered through monitoring, efforts can be made to remediate any problems.

As the landscape starts the healing process following the storm damage of 2022, the previously mentioned practices can help preserve our water resources for all to enjoy. For more information on the efforts being done to keep Tribal waters healthy, feel free to contact the SMC Ecology Department at 715-793-4818.

Wetland crossing where slash was laid down during operations and removed once completed.

Selection salvage by Briarton Logging last winter, west of Murphy Road.

Great looking stream crossing; slash and timber mats were used during operations and removed when done.