Tier II Mitigation Guidance, Part 1: Tier II Impact Calculation and Mitigation Credit System

Purpose

This section of the guidance document is designed to aid applicants going through the Tier II review process with understanding how MDE calculates impacts to Tier II waters with respect to stream buffers, forest cover and impervious cover, for activities that will negatively impact Tier II watersheds, as well as how to achieve mitigation credit for each type of impact. All activities must occur within the Tier II watershed impacted by the project.

Introduction

Sufficient riparian buffers, ample watershed forest cover, and lower levels of impervious cover are essential to maintaining high quality waters. Projects that may permanently impact streams, reduce riparian buffers and forest cover, or increase impervious cover within Tier II watersheds lead to a cumulative decrease in water quality. The impact analysis explained below is applicable to all areas of the whole and complete project within the affected Tier II watershed.

Concepts & Definitions

1. Additionality: Additional credit earned because of voluntary forest retention, voluntary reforestation, documented project redesign, or other project offsets counted from offsite reforestation or offsite conservation above what is minimally required to satisfy county requirements.
2. Buffer Mitigation: Forested stream buffer mitigation credit may be achieved through the establishment of a forested riparian buffer where none currently exists, improvement of an existing stream buffer, or expansion of existing riparian buffer.
    a. Applicants should achieve an average of 100’ buffer, per bank, on each stream segment within the limit of disturbance (LOD). This means that in some cases there may be unavoidable impacts that cause a riparian buffer to be less than 100’, and the buffer mitigation for that segment must be expanded elsewhere.
    b. New riparian buffer creation earns mitigation credit at a 1:1 ratio, acres mitigated to acres created.
    c. Riparian buffer Improvements must occur where no, or sparse forested riparian buffer exists. One half credit per acre is earned for buffer improvement. Documentation, such a surveys and photos of the area proposed for planting, or a site visit is required before MDE approves this type of mitigation.
    d. Buffer expansion shall count up to 300’ per bank within the LOD when calculating area.
3. Conservation: To receive mitigation credit for forest conservation, it can be earned through the voluntary retention of additional existing on-site forest, off-site forest, and all lands are protected in perpetuity by legally enforceable means such as a conservation easement. In addition, areas must be beyond that minimally required by the county or state.

   a. Voluntary forest retention provides on-site forest conservation credit for Tier II mitigation (i.e. due to additionality) because it is above and beyond that minimally required, and conserves in perpetuity acres that would otherwise be available for development.
   b. Forest conservation earns ½ credit per acre conserved.
4. Impacts: The net loss of resources or permanent Tier II impacts associated with the proposed activity subject to Tier II review.
   a. Stream impacts:
      i. Direct impacts: The difference between the existing length of on-site stream segments prior to construction, and the combined length of proposed, post-construction, impacted stream segments due to the project (i.e. places where a road crossing, bridge, or other permanent structure may go), calculated in linear feet (lf) per bank.
      ii. Buffer impacts: The difference between the area of on-site stream buffers prior to project construction, and the area of on-site stream buffer within the LOD post project construction, counting everything within 100' of the stream banks, calculated in square feet (sqft) per bank.
   b. Forest cover impacts: The difference between the total existing on-site forest cover and the total on-site forest cover post project, in acres.
      i. Forest cover impacts can be offset through reforestation, conservation, retrofits (i.e. projects that include the treatment of untreated or traditionally treated impervious cover with ESD), and removal of untreated impervious surfaces.
      ii. Other forms of mitigation may be acceptable on a case-by-case basis.
   c. Impervious cover impacts: Impervious cover impacts are calculated as the total amount of new impervious cover that is NOT treated with environmental site design (ESD) practices.
      i. For total impact calculations, any area that is not treated to ESD 'woods in good' condition (according to Maryland's Stormwater Design Manual, revised May 2009) will be added to the forest cover mitigation total.
      ii. For example, if your project is adding 2 acres of impervious cover and will treat 1 acre with ESD and one acre with traditional structural practices, the one acre of impervious cover treated with traditional structural practices will be added to your total mitigation requirement as 1 acre of net forest loss.
5. Existing: Land use conditions, i.e. forest, field, etc., of the proposed property prior to any site preparation or construction activity associated with a permit or other authorization with is subject to Tier II review.
6. Mitigation: Mitigation is the restoration, establishment, or enhancement, and/or preservation activities undertaken by the applicant.
7. Out-of-Kind Offsets: Mitigation other than riparian buffer planting, afforestation, reforestation, or conservation. Examples include:
   a. Stormwater retrofits: Stormwater retrofits are the installation of stormwater management facilities to treat existing impervious surfaces that were originally installed without ESD

stormwater management techniques. Applicants can receive credit, 1:1, additional acres mitigated to acres treated.

b. Removal of existing impervious surfaces: Applicants can receive credit, 1:1, acres removed to acres mitigated.
c. Redesign: If the applicant can provide appropriate documentation that a project redesign has occurred that results in a reduction of impacts to forest cover, i.e. forest loss, or impervious cover impacts, i.e. impervious cover increases, they may qualify for additional mitigation credit at a 1:1 ratio, acres saved to acres mitigated.
    i. All areas saved because of reducing the original project footprint shall be placed into a conservation easement of similar mechanism.
    ii. These types of approvals are rare, and decisions are made on a case-by-case basis depending on the quality of documentation provided at the time of the redesign credit request.
d. Certain types of stream restorations. Applicants can receive ½ credit for this type of offset.
e. Projects of community benefit: Such partnerships are rare, but not unheard of and can earn both mitigation credit and improve a project's social justification. Examples include:
    i. Partnering with a community group to create an ESD facility for stormwater management and education.
    ii. Helping an education center with creation, funding, etc.

8. Preservation: County required retention of existing on-site forest. This receives no credit for Tier II mitigation.
9. Reforestation/Afforestation: The "*Establishment of a forest on an area on which forest cover has been absent for a long period of time; or Planting of open areas which are not presently in forest cover*" (Code Of Maryland Regulations (COMAR) 08.19.01.03 MD DNR Forest Conservation).
    a. To earn Tier II mitigation for reforested/afforested areas must be conserved in perpetuity, acres that would otherwise be available for development.
    b. Both on and off-site reforestation/afforestation earn mitigation credit for Tier II at a 1:1 ratio, mitigation acre credit to acres reforested.
    c. Credit for Landscaping
        i. A maximum of 10% of the required reforestation/afforestation can be provided in the form of landscaping which is a mix of trees, understory, and a non-turf ground cover.
        ii. The area must be a minimum of 2500 square feet with an average width of 35 feet.
        iii. Landscape stock must be 1 ½ to 2 ½ inch caliper at installation.
        iv. Landscaping receives ¼ credit.
        v. All areas must be placed into permanent conservation easement.
        vi. A planting plan is required.
        vii. A 2-year monitoring plan with reporting is required.
        viii. Credit cannot be received for:
            - Screen trees

- Required landscaping elements such as those required by zoning.

d. Credit for Natural Regeneration
    i. The natural establishment of trees and other vegetation with at least 400 woody, free-to-grow seedlings per acre, which can reach a height of at least 20 feet at maturity can earn mitigation credit for Tier II at a 1:1 ratio, credit acres mitigated to acres reforested.
    ii. All areas must be placed into permanent conservation easement.
    iii. A planting plan is required to address corrective actions if after one growing season there are less than 100 viable specimens remaining.
    iv. 2-year monitoring plan with reporting is required.

10. Upland: Land areas located above the elevation where flooding generally occurs, usually beyond riparian zones.

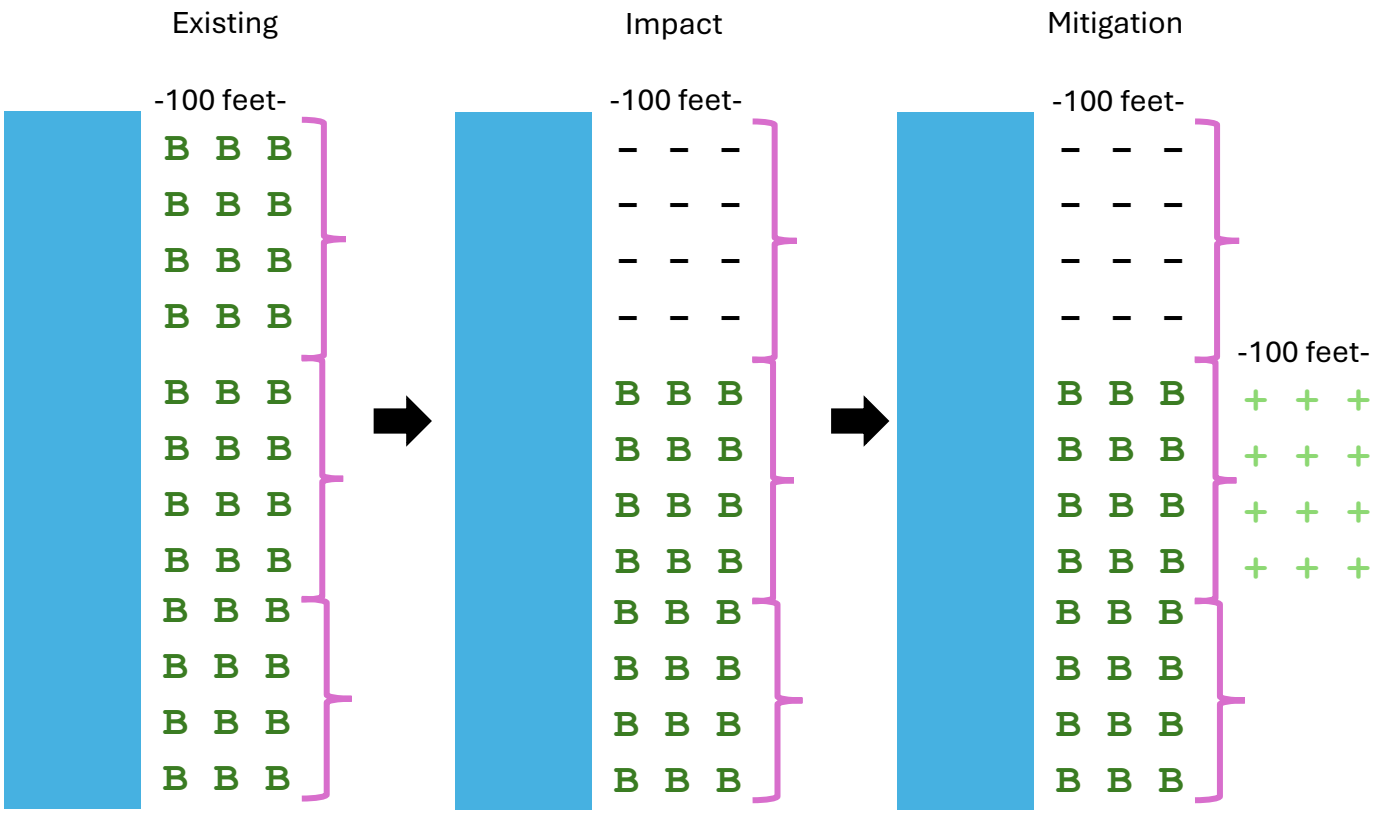
Impact-Mitigation Scenarios

The following pages contain examples of simple impact-mitigation scenarios.

NOTE: Illustrations are simplified and are for example purposes only.

Stream Impacts, Scenario 1: Average 100' Buffer

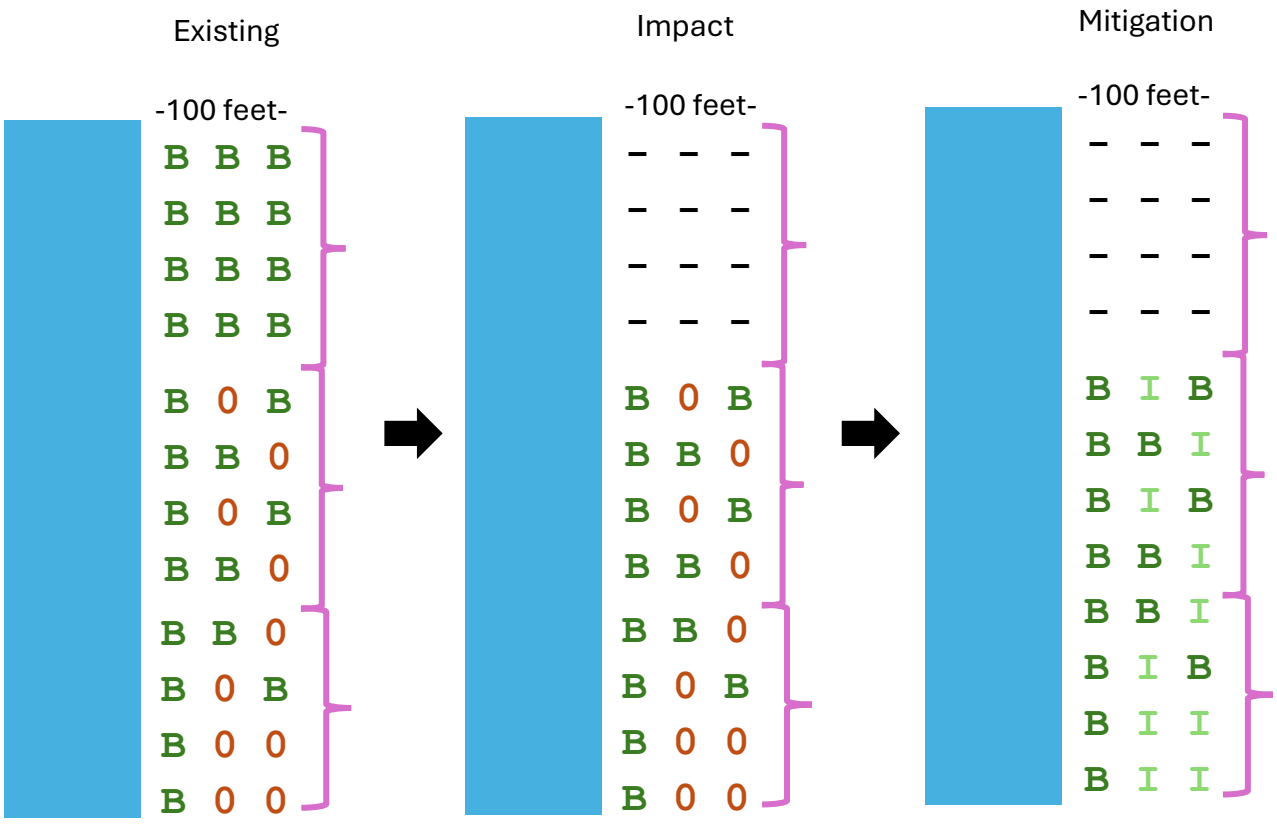
KEY	
	Stream
	Tier II Stream Buffer
B B B	Existing Vegetated Buffer
+ + + +	Buffer Expansion
- - - -	Buffer Impact (Loss)
I I I I	Buffer Improvements
0 0 0 0	No Vegetated Buffer Exists



1. Existing: There's approximately 45,000 sqft of Tier II riparian buffer on-site.
2. Impact: The applicant removes approximately 15,000 sqft of Tier II riparian buffer.
3. Mitigation: The applicant expands the existing riparian buffer by 15,000 sqft to mitigate the impact at a 1:1 ratio. The buffer width now averages 100'.

Stream Impacts, Scenario 2: Buffer Improvements

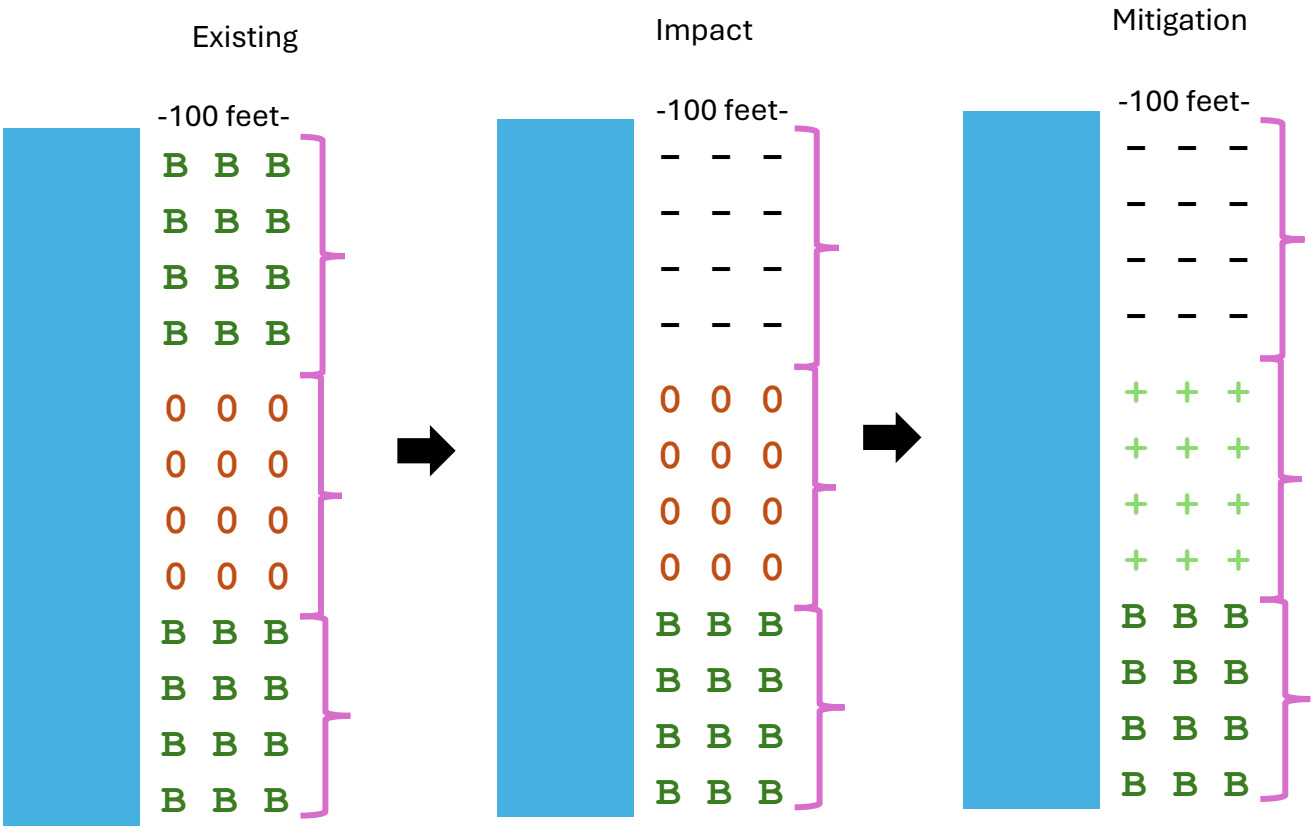
KEY	
	Stream
	Tier II Stream Buffer
B B B	Existing Vegetated Buffer
+ + + +	Buffer Expansion
- - - -	Buffer Impact (Loss)
I I I I	Buffer improvements
0 0 0 0	No Vegetated Buffer Exists



1. Existing: There's approximately 45,000 sqft of Tier II riparian buffer on-site. Portions of the buffer are sparse.
2. Impact: The applicant removes approximately 15,000 sqft of Tier II riparian buffer.
3. Mitigation: After providing documentation identifying areas for buffer improvement, the applicant vegetates portions of the remaining 30,000 sqft of buffer for ½ credit.

Stream Impacts, Scenario 3: Establish Riparian Buffer

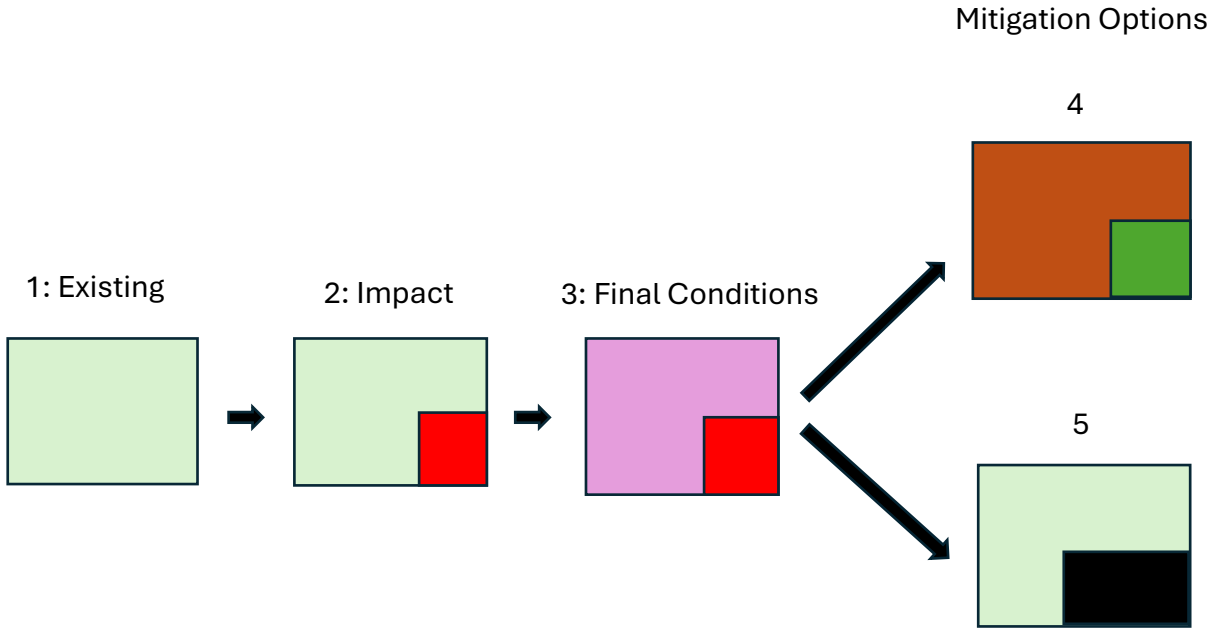
KEY	
	Stream
	Tier II Stream Buffer
B B B	Existing Vegetated Buffer
+ + + +	Buffer Expansion
- - - -	Buffer Impact (Loss)
I I I I	Buffer Improvements
0 0 0 0	No Vegetated Buffer Exists



1. Existing: There's approximately 30,000 sqft of Tier II riparian buffer on-site. Portions of the buffer are not vegetated.
2. Impact: The applicant removes approximately 15,000 sqft of Tier II riparian buffer.
3. Mitigation: The applicant vegetates 15,000 sqft riparian buffer on-site at a 1:1 ratio.

Forest Cover Impacts, Scenario 1 –Baseline 6-acre lot, all forested

KEY	
	Existing Forest
	Existing Field/Ag
	Development
	Preservation of Existing Forest
	On-site Voluntary Conservation of Existing Forest
	On-site Reforestation
	Off-site Conservation of Existing Forest
	Off-site Reforestation



1. Existing: 6-acre lot, all forested

2. Impact: 1 acre cleared

3. Final Conditions: Remaining 5 acres are placed into preservation.

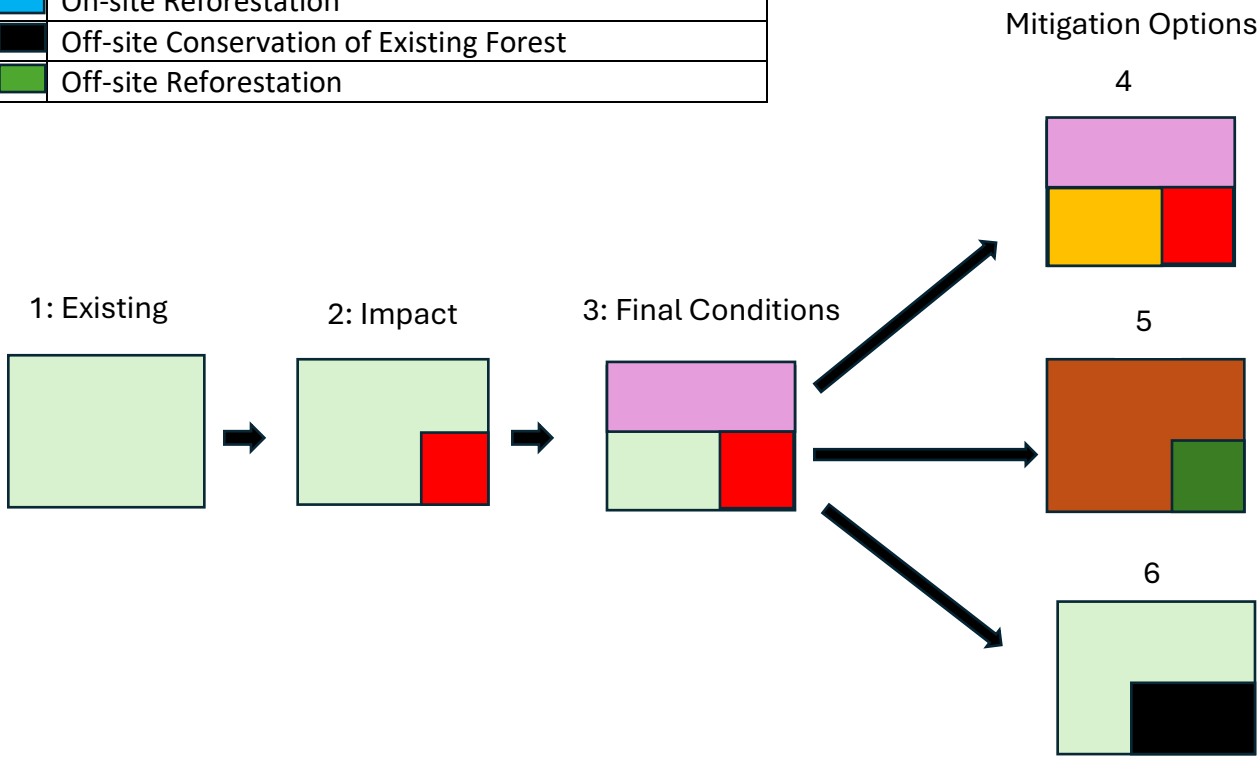
4. Mitigation Option: 1 acre of offsite reforestation.

5. Mitigation Option: 2 acres of offsite forest conservation.

*Note: If the 1 acre of clearing is not treated with ESD, you will need to double the amount of mitigation owed to 2 acres as traditional structural SWM practices do not earn Tier II credit.

Forest Cover Impacts, Scenario 2 – 6 acre lot, all forested

KEY	
	Existing Forest
	Existing Field/Ag
	Development
	Preservation of Existing Forest
	On-site Voluntary Conservation of Existing Forest
	On-site Reforestation
	Off-site Conservation of Existing Forest
	Off-site Reforestation

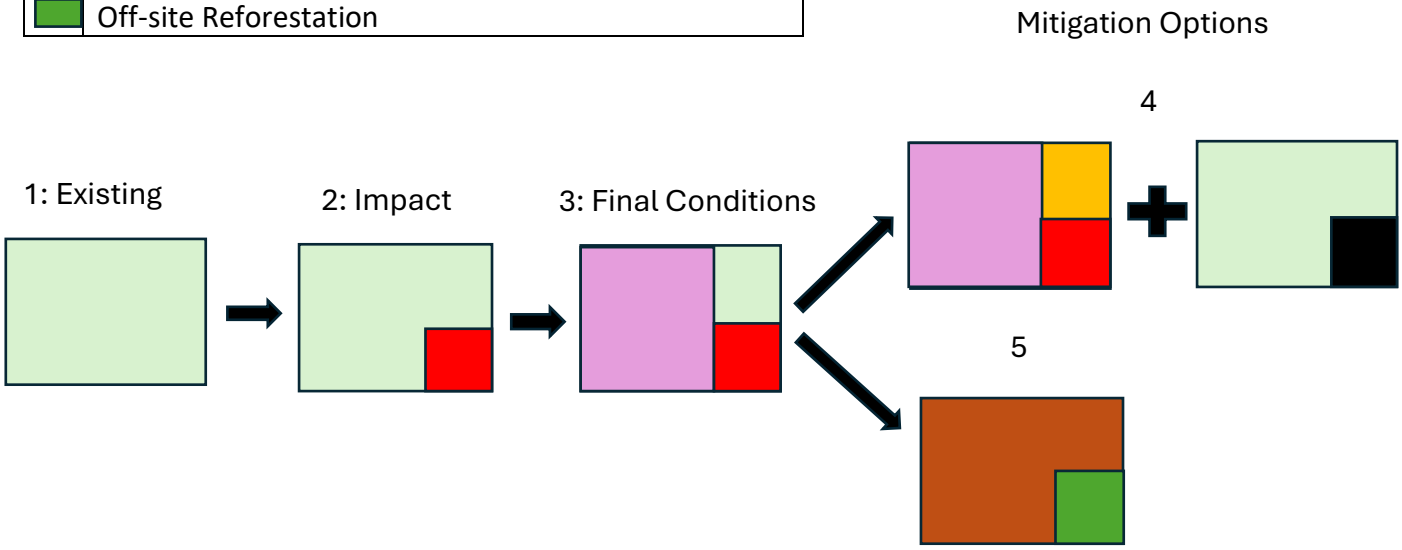


1. Existing: 6-acre lot, all forested
2. Impact: 1 acre cleared
3. Final Conditions: 3 acres are placed into preservation; 2 acres are not.
4. Mitigation Option: 2 acres of voluntary onsite forest conservation.
5. Mitigation Option: 1 acre of offsite reforestation.
6. Mitigation Option: 2 acres of offsite conservation.

*Note: If the 1 acre of clearing is not treated with ESD, you will need to double the amount of mitigation owed to 2 acres as traditional structural SWM practices do not earn Tier II credit.

Forest Cover Impacts, Scenario 3 – 6 acre lot, all forested

KEY	
	Existing Forest
	Existing Field/Ag
	Development
	Preservation of Existing Forest
	On-site Voluntary Conservation of Existing Forest
	On-site Reforestation
	Off-site Conservation of Existing Forest
	Off-site Reforestation

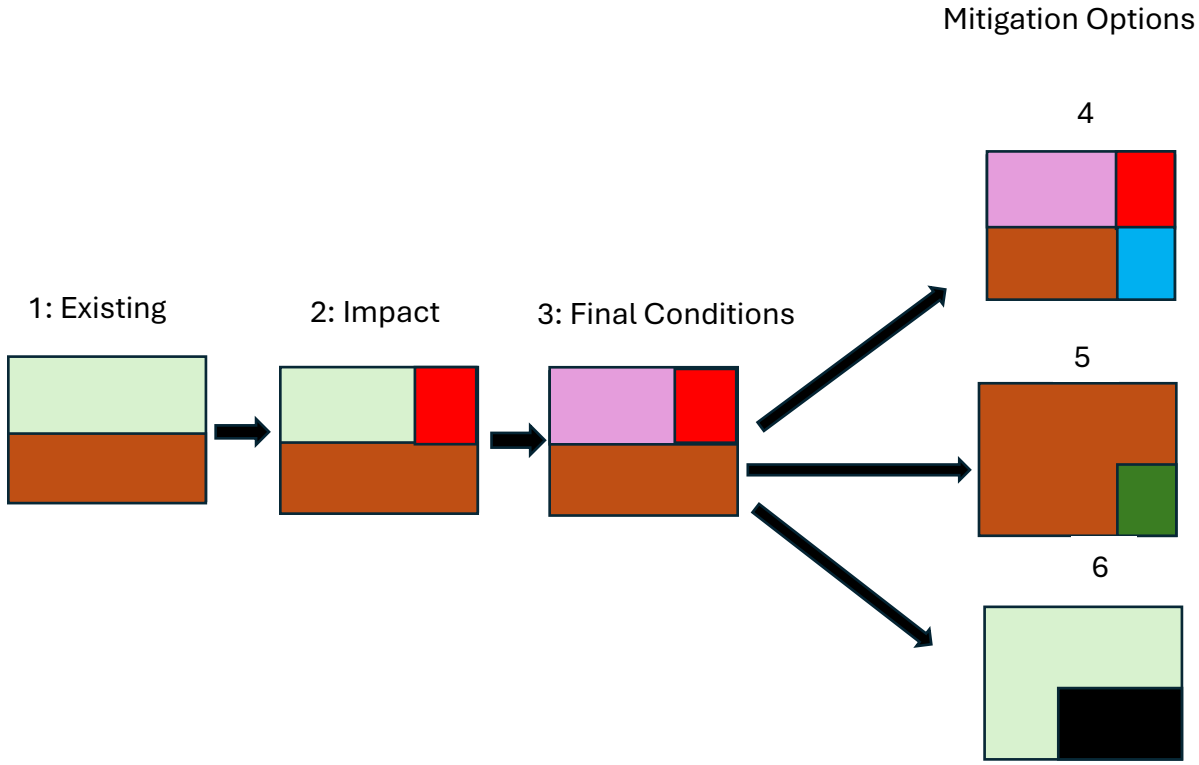


1. Existing: 6-acre lot, all forested
2. Impact: 1 acre cleared
3. Final Conditions: 4 acres are placed into preservation; 1 acre is not.
4. Mitigation Option: 1 acres of voluntary onsite forest conservation in addition to 1 acre of offsite forest conservation.
5. Mitigation Option: 1 acre of offsite reforestation.

*Note: If the 1 acre of clearing is not treated with ESD, you will need to double the amount of mitigation owed to 2 acres as traditional structural SWM practices do not earn Tier II credit.

Forest Cover Impacts, Scenario 4 – 6 acre lot, half forested

KEY	
	Existing Forest
	Existing Field/Ag
	Development
	Preservation of Existing Forest
	On-site Voluntary Conservation of Existing Forest
	On-site Reforestation
	Off-site Conservation of Existing Forest
	Off-site Reforestation



1. Existing: 6-acre lot, half forested
2. Impact: 1 acre cleared
3. Final Conditions: The remaining forested 2 acres are placed into preservation. The remaining 3 acres of field are not.
4. Mitigation Option: 1 acre of onsite reforestation.
5. Mitigation Option: 1 acre of offsite reforestation.
6. Mitigation Option: 2 acres of offsite conservation.

*Note: If the 1 acre of clearing is not treated with ESD, you will need to double the amount of mitigation owed to 2 acres as traditional structural SWM practices do not earn Tier II credit.

Tier II Mitigation Guidance, Part 2: Completing Tier II Mitigation

Purpose

This section of the guidance document is designed to help applicants meet the minimum requirements for mitigation plan development during the Tier II Review. Applicable activities are listed in COMAR 26.08.03.04-2 E: a wetlands and waterways permit, water quality certification, and National Pollutant Discharge Elimination System (NPDES) permits in a Tier II watershed that will result in a new, or an increased, permitted annual discharge of pollutants or a potential impact to water quality.

Guidance Information:

Tier II Waters

Tier II, high quality, waters are those that have an existing water quality that is significantly better than the minimum requirements, as specified in water quality standards. Maryland's Tier II streams are designated based on biological community scores for benthic macroinvertebrates (or 'aquatic bugs'), and fish. MDE bases its decision on data collection and analysis procedures that follow the Maryland Biological Stream Survey (MBSS) protocols developed by the Maryland Department of Natural Resources (DNR). The analysis protocol generates index of biotic integrity (IBI) scores for benthic and fish data from 1.00-5.00. Any stream where both independent benthic macroinvertebrate IBI and fish IBI scores are 4.00 or greater are designated Tier II. The purpose of the Tier II antidegradation review is to protect and maintain Tier II high quality waters from degradation. The review process identifies impacts associated with a given regulated activity and then identifies if there are appropriate alternatives that may avoid these impacts to Tier II waters. If impacts cannot be avoided, then the review identifies reasonable alternatives that may minimize or mitigate impacts within the Tier II watershed. More broadly, the review identifies practices that could be considered along with existing conservation, restoration, and planning activities. Mitigation is an integral part of the minimization process. While certain losses may be unavoidable, those losses could be mitigated either on-site or elsewhere within the Tier II watershed impacted by the activity.

Functions

Permitted activities may disrupt or remove various functions of streams, buffers, forest cover, and increase issues related to impervious cover. The Environmental Protection Agency (EPA), peer reviewed literature, and DNR have linked poor in-stream biological conditions to key stressors such as riparian disturbances, increased impervious surfaces, and decreased watershed forest cover. While streams provide a diverse habitat for macroinvertebrates and fish, riparian buffers help to provide shade which regulates stream temperatures and provides a critical food source. Buffers can help regulate stream flow and reduce excess nutrient loads, sedimentation and bank erosion, all of which lead to cumulative degradation of aquatic stream resources. A

riparian minimum buffer of 100' helps to support higher quality stream resources. Forested watersheds protect in-stream biology by helping to improve infiltration, regulate water velocity, reduce sedimentation and pollutant runoff into streams, and provide a food source to aquatic life. There is a clear link between impervious surface and water quality degradation, and the higher the amount of impervious surface in a watershed, the less diverse, less sensitive, and the more stressed the aquatic community becomes.

Watershed Implementation Approach

The Tier II review is implemented on a watershed basis using an upstream approach intended to protect downstream water quality. This means that regulated activities occurring anywhere within a Tier II watershed area may require a Tier II review. No net change is the overarching goal of the Tier II review. This is achieved by avoiding and reducing water quality impacts as much as is possible. The goal of compensatory mitigation is to offset unavoidable water quality impacts to Tier II waters.

Preferred Mitigation Options

- Preferred alternatives for buffers impacts are as follows, in order of priority: on-site restoration, on-site creation, on-site improvement, off-site replacement, and off-site improvement.
- Preferred alternatives forest cover reduction and impervious surface increases that are not treated with environmental site design (ESD) practices are as follows, in order of priority: on-site reforestation, voluntary conservation above that which is minimally required, off-site reforestation, retrofits, removal of existing untreated impervious cover, and community improvement partnerships.
- Preferred lands for mitigation include private property, upland disturbed areas, agricultural stream buffers, and areas adjacent to existing riparian buffers or watershed forest cover.

Mitigation Credits

Please note: The same area cannot be used as credit for multiple projects. You cannot receive credit for forest clearing to plant for 1:1 credit unless those areas are clearly delineated on design plans for temporary clearing during construction. These types of impacts should be minimized. Recorded easement documentation is required before MDE approves any type of conservation mitigation.

Mitigation Implementation

There are 3 types of mitigation implementation accepted, applicant responsible mitigation (ARM), mitigation banking, and fee-in-lieu.

- Applicant responsible mitigation is the preferred method of mitigation and is where the applicant implements mitigation either on-site or within the same Tier II watershed of the impact. The applicant is responsible for planning, planting, securing protection measures, reporting, and mitigation success.
- Mitigation banks allow an applicant to purchase credits of an area that is already forested for conservation.

- Fee-in-lieu mitigation, the least preferred type of mitigation, is where the applicant makes a payment into a program that manages the money to go towards future restoration, enhancement, or conservation efforts. To use this type of mitigation, an applicant must be able to provide documentation that the funds are/will be spent in the impacted Tier II watershed.

Applicant Responsible Advanced Mitigation

Applicant responsible ADVANCED mitigation is where the applicant locates mitigation properties and other opportunities before beginning their official Tier II review. While this may help expedite the eventual Tier II review, prior to undertaking any advanced mitigation initiatives, the applicant is strongly encouraged to coordinate with MDE to ensure that time and money are invested wisely.

Mitigation Approval Process

1. Complete and submit the *Tier II Minimization Alternatives Analysis* form to determine the quantity of each proposed impact to streams, buffers, forest, or impervious cover.
2. Complete and submit the *Tier II Mitigation Report* to identify appropriate mitigation sites. Provide a brief description of the location (coordinates, address, map and parcel number) along with a GIS file of the site, method of mitigation (reforestation, afforestation, improvement, etc.), and credits earned. Describe site selection process and the process used to narrow results (i.e. excluding state or federal owned land, etc.). To demonstrate due diligence that a rigorous search has been conducted, applicants must provide the original, unedited list of properties returned from the initial site search.
3. Complete and submit the *Tier II Report (SEJ)*.
4. For public notice, the Tier II Mitigation Report must include a draft conservation agreement between the applicant and the landowner that has been submitted to the county for approval, completed Tier II Mitigation Alternatives Analysis Form, and an adequate Tier II Report containing the social and economic justification. This applies only to nontidal wetlands and waterways construction permits or authorizations.
5. The Department will review the Mitigation Report and the Tier II Report.
6. Complete and submit the *Tier II Mitigation Plan*.
7. The Department will review the Tier II Mitigation Plan and supporting documentation.
8. Provide final documentation that the mitigation site has been protected in perpetuity through easement, covenant, deed, etc. This step must be completed to receive a nontidal wetlands or waterways construction permit authorization.
9. The Department will issue a Tier II letter stating the review is complete and satisfied.
10. For the General Permit For Discharges of Stormwater Associated With Construction Activity Maryland General Permit No. 20-CP (20-CP):
    a. You will be required to a Tier II review letter to be eligible for public notice and obtain coverage under the 20-CP , i.e., receive your notice of intent to proceed with construction.

   b. For projects requiring coverage under the General Permit for Stormwater During Construction (20-CP), there is a conditional approval process. To qualify an applicant must provide the draft conservation easement documentation that has been submitted to the county and is awaiting approval. Construction cannot start before final documentation has been received by the date identified in the Tier II letter. The project must not require a nontidal wetlands or waterways construction permit or authorization. All other conditions apply.

11. Once approved, plant mitigation sites, and start monitoring for annual reporting. Sites must be monitored for a minimum of 2 years. Notify the Department at the start of grading and once planting is complete.
12. Monitor the project for the required period to ensure performance standards are met by addressing mortality, invasive and noxious species, predation, etc. Submit monitoring reports annually to the Department.
13. Notify the Department of any property or easement transfers as directed in accordance with a Tier II special condition, if a permit is issued.

Protection Mechanism

Approved methods of protection include conservation easements, deed restrictions, restrictive covenants, or deeding the land to a land conservation organization or public agency. A conservation easement is preferable to deed restrictions and restrictive covenants for private land and must be considered first. The selected protection mechanism must be approved by the Department prior to actual implementation. It must include language to allow MDE access to the mitigation site in perpetuity. Please note that the amount of mitigation identified in the draft easement, if used for the purposes of public notice, shall be required at a minimum before approval can be granted.

Additional Things of Note

- Your SEJ and Tier II Mitigation Analysis Report may be found acceptable and are required for public notice, but they shall not be considered approved until after relevant public comments are addressed, the Tier II Mitigation Plan has been evaluated and approved, and the final permitting decision is made.

References:

https://www.nps.gov/im/ncpn/uplands.htm#:~:text=Uplands%20are%20land%20areas%20lying,grasslands%2C%20woodlands%2C%20and%20forests. Accessed 4/23/2025