



# Environmental Impact

Maryland’s horse country is also Bay Country, closely linked by a dense, 17,000-mile network of streams and rivers that feed the Bay. With more than 87,000 horses, Maryland has twice as many horses per square mile as Kentucky, Virginia, Texas and California. This high density of horses can pose a serious threat to water quality and natural resources. Eroding soil from over-grazed pastures and rainwater runoff from unmanaged manure piles carry excess nutrients and sediment to the Bay and its tributaries.

This self assessment guide for horse owners will take about 35 minutes to do. It will give you a better understanding of the impact your equine operation is having on the environment and what you can do to improve that impact and increase the value of your property.

This table determines potential environmental impacts associated with your current horse operation. For each statement on the left, read across to the right and find the statement in a box that best describes conditions on your farm. If a statement does not apply, simply skip the question. Check the appropriate impact ranking box in the last column. The words in bold indicate that definitions can be found at the back of the document in the glossary.

| HORSE FARM MANAGEMENT PRACTICES |   |   |   |   |  |
|---------------------------------|---|---|---|---|--|
|                                 | LOW IMPACT  | LOW TO MODERATE IMPACT  | MODERATE TO HIGH IMPACT   | HIGH IMPACT   | YOUR IMPACT  |
| <b>PASTURE MANAGEMENT</b>       |   |   |   |   |  |
| <b>Grazing intensity</b>        | Plants not grazed lower than 3” for cool-season <b>perennial</b> forages recommended for pastures; at least 85% ground cover of <b>forage species</b> ; animals are rotated for pastures to recover from grazing. | Plants not grazed lower than 3” for cool-season <b>perennial</b> forages recommended for pastures; greater than 70% ground cover of <b>forage species</b> ; animals are rotated for pastures to recover from grazing. | Plants grazed lower than 3” for cool-season <b>perennial</b> forages recommended for pastures; less than 70% ground cover; little rotation/ recover from grazing of pastures. | Plants grazed lower than 3” for cool-season <b>perennial</b> forages recommended for pastures; less than 50% ground cover of <b>forage species</b> ; no rotation/ recover from grazing of pastures. | <input type="checkbox"/> Low - 5<br><input type="checkbox"/> Low-Mod - 4<br><input type="checkbox"/> Mod-High - 2<br><input type="checkbox"/> High - 0 |

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| <b>PASTURE MANAGEMENT (continued)</b>         |   |  |   |   |  |
| <b>Weed Invasion</b>                          | Invasion of undesirable weedy species is minimal; a healthy stand of <b>forage species</b> is maintained; undesirable weeds comprise less than 5% of the pasture.   | Undesirable weeds comprise 5 to 15% of the pasture; periodic weed control measures are taken.  | Undesirable weeds comprise 15 to 30% of the pasture; weed control measures are not routinely taken. | No weed control: desirable forage stand is suppressed due to weed invasion; weed comprise more than 30% of the pasture. | <input type="checkbox"/> Low - 5<br><input type="checkbox"/> Low-Mod - 4<br><input type="checkbox"/> Mod-High - 2<br><input type="checkbox"/> High - 0 |
| <b>Maintenance</b>                            | Follow rotational grazing plan; pastures are mowed and dragged when horses are moved/rotated.   | Horses are rotated; pastures are mowed and dragged occasionally.   | Little rotation; mowing and dragging sporadically.  | No rotation; pastures are not mowed and dragged.  | <input type="checkbox"/> Low - 5<br><input type="checkbox"/> Low-Mod - 4<br><input type="checkbox"/> Mod-High - 2<br><input type="checkbox"/> High - 0 |
| <b>Forage species</b>                         | Selection is based on soil, site conditions, and management objectives following technical recommendations and following recommended seeding dates and field conditions needed to meet <b>grazing intensity</b> guidelines. | Selection is based on personal preference and/or standard horse pasture seed mix; follow some but not all of recommendations for seeding dates and field conditions. | Use whatever seed is available and seed outside of recommended dates and soil conditions.           | No seeding/ reseeded is done  | <input type="checkbox"/> Low - 5<br><input type="checkbox"/> Low-Mod - 4<br><input type="checkbox"/> Mod-High - 2<br><input type="checkbox"/> High - 0 |
| <b>Sacrifice lot</b>                          | Use for feeding or exercise when pastures are wet, overgrazed, under renovation or drought stricken in conjunction with a grazing plan.   | Use sometimes to feed or exercise when pastures are muddy, overgrazed, under renovation or drought stricken.   | Use sporadically or as open/unmanaged access.   | No sacrifice area.  | <input type="checkbox"/> Low - 5<br><input type="checkbox"/> Low-Mod - 4<br><input type="checkbox"/> Mod-High - 2<br><input type="checkbox"/> High - 0 |
| <b>SOIL FERTILITY AND NUTRIENT MANAGEMENT</b> |   |  |   |   |  |
| <b>Soil Testing</b>                           | Every 3 years with historical soil test records.  | Every 3 years without historical soil test records.  | Less frequent than 3 years.   | Never.  | <input type="checkbox"/> Low - 5<br><input type="checkbox"/> Low-Mod - 4<br><input type="checkbox"/> Mod-High - 2<br><input type="checkbox"/> High - 0 |

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|---|---|---|---|--|--|
|   | LOW IMPACT  | LOW TO MODERATE IMPACT  | MODERATE TO HIGH IMPACT   | HIGH IMPACT                              | YOUR IMPACT  |
| <b>SOIL FERTILITY AND NUTRIENT MANAGEMENT</b> (continued) |   |   |   |  |  |
| <b>Nutrient management plan</b>                           | Follow recommendation of certified <b>nutrient management plan</b> with operational changes included.   | Follow recommendation of certified <b>nutrient management plan</b> .  | Follow general nutrient recommendations.  | <b>No nutrient management plan.</b>      | <input type="checkbox"/> Low - 5<br><input type="checkbox"/> Low-Mod - 4<br><input type="checkbox"/> Mod-High - 2<br><input type="checkbox"/> High - 0 |
| Nutrient analysis, application timing, and pasture budget | Manure/fertilizer is applied based on realistic pasture production estimates during the growing season; manure is analyzed for nutrient content; application equipment is routinely <b>calibrated</b> . | Manure/fertilizer is applied based on realistic pasture production estimates during the growing season; nutrients from manure are estimated using table values; equipment <b>calibrated</b> periodically. | Manure/fertilizer applied without regard to soil test or nutrient management plan recommendations; application equipment is not <b>calibrated</b> . | No considerations.                       | <input type="checkbox"/> Low - 5<br><input type="checkbox"/> Low-Mod - 4<br><input type="checkbox"/> Mod-High - 2<br><input type="checkbox"/> High - 0 |
| Record keeping  | 3 to 6 years of historical records of manure/fertilizer application; manure imports and exports are documented.   | Less than 3 years of historical records of manure/fertilizer application; manure imports and exports are documented.  | Minimal record keeping of on farm application; no records of manure leaving the farm.   | No nutrient management records are kept. | <input type="checkbox"/> Low - 5<br><input type="checkbox"/> Low-Mod - 4<br><input type="checkbox"/> Mod-High - 2<br><input type="checkbox"/> High - 0 |
| pH/liming   | 6.8 – 6.2; history of lime applications according to soil test.   | 6.1 – 5.8; some records of lime application according to soil test.   | 5.7 – 5.5; no records of lime application.  | <5.5 or unknown.                         | <input type="checkbox"/> Low - 5<br><input type="checkbox"/> Low-Mod - 4<br><input type="checkbox"/> Mod-High - 2<br><input type="checkbox"/> High - 0 |

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|---------------------------------|---|---|--|--|--|
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| <b>SACRIFICE LOT</b>            |   |   |  |  |  |
| General location                | Located at least 100 ft downslope from well; 100 ft from <b>surface water</b> .   | Located 50 to 100 ft downslope from well; 100 ft from <b>surface water</b> .  | Located upslope and at least 100 ft from well; 50 ft. away from <b>surface water</b> .         | Located upslope and within 100 ft of well; within 25 ft of <b>surface water</b> .                                | <input type="checkbox"/> Low - 5<br><input type="checkbox"/> Low-Mod - 4<br><input type="checkbox"/> Mod-High - 2<br><input type="checkbox"/> High - 0 |
| Lot runoff                      | No <b>runoff</b> from area, 50-100 ft. of well established grass; covered structures have <b>roof runoff</b> management | <b>Runoff</b> management outlets to grassed waterway or <b>diversion</b> , 25-50 ft. of well established grass surrounds lot or area. | No <b>runoff</b> management, 25-50 ft. of well established grass surround lot or area.         | No <b>runoff</b> management less than 25 ft. of grass surrounds lot or area.                                     | <input type="checkbox"/> Low - 5<br><input type="checkbox"/> Low-Mod - 4<br><input type="checkbox"/> Mod-High - 2<br><input type="checkbox"/> High - 0 |
| Manure management               | Manure is collected daily for <b>compost</b> for farm use or disposal using <b>nutrient management</b> guidelines.      | Manure is collected weekly for <b>compost</b> for farm use or disposal using <b>nutrient management</b> guidelines.                   | Manure is collected every 4 weeks or more; <b>nutrient management</b> guidelines are not used. | Manure accumulates; <b>nutrient management</b> guidelines are not used.  | <input type="checkbox"/> Low - 5<br><input type="checkbox"/> Low-Mod - 4<br><input type="checkbox"/> Mod-High - 2<br><input type="checkbox"/> High - 0 |
| <b>HEAVY USE PADS</b>           |   |   |  |  |  |
| General location                | Located at least 100 ft downslope from well; 100 ft from <b>surface water</b> .   | Located 50 to 100 ft downslope from well; 100 ft from <b>surface water</b> .  | Located upslope and at least 100 ft from well; 50 ft away from <b>surface water</b> .          | Located upslope and within 100 ft of well; within 25 ft of <b>surface water</b> ; lack of <b>heavy use pad</b> . | <input type="checkbox"/> Low - 5<br><input type="checkbox"/> Low-Mod - 4<br><input type="checkbox"/> Mod-High - 2<br><input type="checkbox"/> High - 0 |
| Construction                    | Used established guidelines to construct <b>heavy use pads</b> in all <b>high traffic areas</b> .                       | Used established guidelines to construct <b>heavy use pads</b> in some <b>high traffic areas</b> .                                    | Did not construct <b>heavy use pads</b> in some <b>high traffic areas</b> .                    | <b>High traffic areas</b> have significant erosion and bare soil; no <b>heavy use pads</b> in use.               | <input type="checkbox"/> Low - 5<br><input type="checkbox"/> Low-Mod - 4<br><input type="checkbox"/> Mod-High - 2<br><input type="checkbox"/> High - 0 |

| HORSE FARM MANAGEMENT PRACTICES                                     |   |  |   |  |  |
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| <b>HEAVY USE PADS (continued)</b>                                   |   |  |   |  |  |
| <b>Runoff</b>   | No dirty <b>runoff</b> from area; 50 to 100 ft of well established grass surrounds <b>heavy use pads</b> .  | <b>Runoff</b> managed, with diversions or at least 25 ft of grass surrounds <b>heavy use pads</b> .  | 10 to 25 ft of sparse grass surrounds <b>heavy use pad</b> .  | Less than 10 ft of sparse grass surrounds the <b>heavy use pad</b> ; no <b>runoff</b> management.                                  | <input type="checkbox"/> Low - 5<br><input type="checkbox"/> Low-Mod - 4<br><input type="checkbox"/> Mod-High - 2<br><input type="checkbox"/> High - 0 |
| Maintenance   | Collect and store manure 2 times per week and replace stone/surface material to maintain level as installed.  | Collect and store manure once a month; area is inspected every 1 to 2 years.   | Manure is allowed to build up; maintenance is minimal.  | Manure is not removed; no replacement of stone/surface material.   | <input type="checkbox"/> Low - 5<br><input type="checkbox"/> Low-Mod - 4<br><input type="checkbox"/> Mod-High - 2<br><input type="checkbox"/> High - 0 |
| <b>SURFACE WATER – PONDS, STREAMS, DITCHES, AND ADJOINING AREAS</b> |   |  |   |  |  |
| Condition of vegetative strip along <b>surface water</b>            | 90% ground cover of grass within 25 ft of <b>surface water</b> ; adequately designed crossing of <b>surface water</b> .   | 75 to 90% ground cover with grass within 25 ft of <b>surface water</b> ; a few bare areas and manure deposits are evident.                       | 60 to 75% ground cover with grass within 25 ft of <b>surface water</b> ; some signs of bank erosion are evident and numerous manure deposits exist.                   | Less than 60% ground cover with grass within 25 ft of <b>surface water</b> ; bank erosion evident; numerous manure deposits exist. | <input type="checkbox"/> Low - 5<br><input type="checkbox"/> Low-Mod - 4<br><input type="checkbox"/> Mod-High - 2<br><input type="checkbox"/> High - 0 |
| Horse access to <b>surface water</b> for water supply               | Horse access is restricted from <b>surface water</b> ; alternative water supply sources are provided for water needs; horses are excluded from <b>surface water</b> . | Horses are allowed controlled access to <b>surface water</b> ; stream banks with animal access protected with <b>geotextile cloth</b> and stone. | Horses are allowed occasional access at designated areas between late spring and early fall; condition of stream banks with animal access is not routinely inspected. | Horses are allowed unlimited access throughout the year; condition of stream banks with animal access is not routinely inspected.  | <input type="checkbox"/> Low - 5<br><input type="checkbox"/> Low-Mod - 4<br><input type="checkbox"/> Mod-High - 2<br><input type="checkbox"/> High - 0 |

| HORSE FARM MANAGEMENT PRACTICES      |  |   |  |  |  |
|--------------------------------------|--|---|--|--|--|
|                                      | LOW IMPACT                                     | LOW TO MODERATE IMPACT  | MODERATE TO HIGH IMPACT  | HIGH IMPACT  | YOUR IMPACT  |
| <b>WETLANDS</b>                      |  |   |  |  |  |
| Horse access to <b>wetland</b> areas | Horses are excluded from <b>wetland</b> areas. | Horses are allowed managed access to <b>wetland</b> areas during periods of seasonal low water table. | Horses are allowed managed access during periods of seasonal high water table. | Horses are allowed unlimited access to <b>wetland</b> areas. | <input type="checkbox"/> Low - 5<br><input type="checkbox"/> Low-Mod - 4<br><input type="checkbox"/> Mod-High - 2<br><input type="checkbox"/> High - 0 |

**Action Plan**

An action plan is a tool that allows you to take the needed steps to modify the areas of concern as identified by your assessment. The outline provided below is a basic guide for developing an action plan. Consult the list of contacts and references on the next page if assistance is needed to develop a detailed action plan.

**SCORING**

- 90-100: A                    Congratulations! Your equine operation is being managed to have a low impact on the environment.
- 89-75: B                    Your equine operation is being managed to have a low to moderate impact on the environment. Contact your local Soil Conservation District to find out how to reduce the impact your equine operation is having on the environment and increasing the value of your property.
- 74-60: C                    Your equine operation is having a moderate to high impact on the environment. Contact your local Soil Conservation District to find out how to reduce the impact your equine operation is having on the environment and increasing the value of your property.
- 59&below: Help            Your equine operation is having a high impact on the environment. Contact your local Soil Conservation District to find out how to reduce the impact your equine operation is having on the environment and increase the value of your property.

HOW pasture and manure management factsheets are available at [www.horseboard.org/how](http://www.horseboard.org/how)

| CONTACTS AND REFERENCES                                       |   |  |  |
|---|---|--|--|
| Organization  | Responsibilities  | Address  | Phone Number   |
| Maryland Dept of Agriculture, Office of Resource Conservation | Opportunities for pollution prevention for farmers and others. Maryland's regulations regarding Animal Waste Management.  | 50 Harry S Truman Pkwy Annapolis MD 21401  | 410-841-5865<br><a href="http://www.mda.state.md.us/resource_conservation/">www.mda.state.md.us/resource_conservation/</a> |
| University of Maryland and Cooperative Extension              | Information about soil testing, forage species, and nutrient, weed, pest management, and animal health  | 1202 Symons Hall, UM, College Park MD 20742-5551   | 301-405-2907<br><a href="http://extension.umd.edu/">//extension.umd.edu/</a>   |
| USDA Natural Resources Conservation Service                   | Assistance with conservation planning and design of heavy use area protection, stream crossings, grazing systems, pasture planting, riparian buffers, and nutrient and pest management plans. | John Hanson Business Center, 339 Busch's Frontage Road, Suite 301, Annapolis MD 21409-5561 | 410-757-0861<br><a href="http://www.md.nrcs.usda.gov/">www.md.nrcs.usda.gov/</a>   |

## Glossary

**Calibrate:** Procedure for determining the actual rate of manure/fertilizer applied by a spreader and adjusting it to obtain the desired agronomic rate for a field. This assures that manure is applied to a field at the desired application rate, one that meets the nutrient needs of the forage species, while minimizing adverse environmental impacts.

**Compost:** Is the transformation of organic material (i.e., the plant material in your horse's manure) into a nutrient rich soil-like material through decomposition.

**Diversion:** Earthen embankment that directs runoff water from a specific area.

**Forage Species:** Forage is what your horses consume by grazing and is desirable grass and legume varieties.

**Geotextile Cloth:** Multitude of woven or non-woven fabrics designed with specific physical properties for either filtration or soil reinforcement.

**Grazing Intensity:** Number of animals per unit area of available forage.

**Heavy Use Pad:** An area frequented by livestock and in which animals tend to linger and congregate, such as areas used to provide supplemental feed, minerals and water.

**Heavy Use Pad Protection:** Protecting heavily used areas by establishing vegetative cover, by surfacing with suitable materials, or by installing needed structures.

**High Traffic Areas:** Gates, shelters, water and feeding areas where difficult to maintain vegetation.

**Minimum Grazing Height:** The minimum height to graze forage crops without loss of stand, sacrifice of plant vigor, and reduction of regrowth potential.

**Nutrient Management Plan:** A specific plan for managing plant nutrient applications for the highest economic benefit and environmental protection.

**Perennial:** Persisting for several years usually with new herbaceous growth from existing surface or subsurface vegetative structures.

**Pest Management Plan:** A specific plan for managing pests to achieve the highest economic return and prevent environmental contamination. Pest management plans can include biological, chemical, and mechanical control measures.

**Roof Runoff:** System of gutter, downspouts, underground outlets used to manage rainwater.

**Runoff:** Water that has not moved into the soil but moves across the soil or another surface.

**Sacrifice Lot:** A small paddock or exercise lot for horses. It requires little maintenance and can be used for feeding or exercise whenever your pastures are wet, over-grazed, under renovation, or drought stricken.

**Soil Testing:** Is used to determine the amount and type of fertilizer needed for growing forage species. Recommendations will be provided by the soil testing lab on the nutrients that are needed for your soil. The following links will provide you with information on soil sampling procedures, comparison of soil test labs and general info

[http://anmp.umd.edu/Plan/Soil\\_Samp\\_Card.pdf](http://anmp.umd.edu/Plan/Soil_Samp_Card.pdf)

[http://anmp.umd.edu/Plan/Soil\\_Lab\\_Comp.pdf](http://anmp.umd.edu/Plan/Soil_Lab_Comp.pdf)

[http://anmp.umd.edu/Plan/Plan\\_Writing.html](http://anmp.umd.edu/Plan/Plan_Writing.html)

**Stream Crossing:** A trail or travelway constructed across a stream to allow livestock or equipment to cross with minimal disturbance to the stream and aquatic environment.

**Surface Water:** Ponds, streams, ditches, and adjoining areas, a permanent, existing body of water.

**Wetland:** A lowland area, marsh or swamp, that is periodically saturated with moisture. The Soil Conservation District can provide assistance on wetland identification.

Reviewed by members of the Maryland Horse Outreach Workgroup. The Horse Outreach Workgroup was established to provide information to horse owners on pasture and manure management issues. Technical assistance is available from local county Soil Conservation Districts/Natural Resource Conservation Service and the Maryland Cooperative Extension office. The workgroup consists of representatives from local Soil Conservation Districts, Maryland Department of Agriculture, Natural Resource Conservation Service, Cooperative Extension, University of Maryland, the Equiery, and the Maryland Horse Council. The Maryland Department of Agriculture's Office of Resource Conservation provides coordination for the workgroup.

For more information on horse manure management and other soil conservation and water quality practices, contact you local Soil Conservation District. For more information contact your local Soil Conservation District/ Natural Resources Conservation Service/ (SCD/ NRCS) office or county Maryland Cooperative Extension (MCE) office. Addresses and phone numbers can be found at [http://www.mda.state.md.us/resource\\_conservation/technical\\_assistance/index.php](http://www.mda.state.md.us/resource_conservation/technical_assistance/index.php) , <http://www.md.nrcs.usda.gov/contact/directory> or <http://extension.umd.edu> or check the listing County Government for SCD/MCE or US Government, Department of Agriculture for NRCS of the phone book blue pages. January 2004, revised January 2007