Mapping Proposed Phase 6 Land Uses and Related Information

Comments received by April 30, 2014

Responses and comments from Peter Claggett in blue

I. GENERAL & BACKGROUND COMMENTS

VA-DEQ: This *[the criteria that a land use exhibits unique nutrient and sediment load/processing characteristics]* should be the primary if not exclusive reason justifying a land use be included in phase 6.x. If this cannot be satisfied there is no justification to include the land use for simulation regardless of BMPs or desire for targeting. If the loadings cannot be justified then application of BMPs to control those loadings and targeting of those BMPs to those areas likewise cannot be justified.

PRC: Differential loading rates are the primary factor warranting consideration for a proposed new land use category but not the sole factor because two land uses might load the same but be treated very differently from a BMP and management perspective. Similarly behaving land uses could be aggregated for model calibration and simulation and then disaggregated in Scenario Builder. However, it might just be simpler to keep them separate with the knowledge that they behave the same.

VA-DEQ: And if there currently is no BMP or BMPs to treat the proposed land use should it be excluded? Most BMPs are applied to land uses that loading characteristics are understood. What if we really cannot satisfy the first and primary criteria of unique loading characteristics justifying a separate and uniquely simulated land use even if we have BMPs approved? If they are currently an approved BMP it is already associated with a simulated land use. Not sure this *[the criteria that land use is associated with a particular type(s) of BMP]* should be a justification for separating out a land use for simulation.

PRC: While all BMP's are now associated with a simulated land use, those associations may be indirect. Further refining the land uses could improve the direct association.

VA-DEQ: Like phase 5.x phase 6.x is most probably going to be at best a regional scale model that will have no real ability to be used to target within a locality. Regional targeting ability might be used to justify a land use but doubt the resolution of the various inputs will allow sub-locality targeting. Targeting at the scale of model operation is between counties within a region not within a single county or city. This *[the criteria that land use is needed to help target local implementation of BMPs]* should be removed as a basis for creation of a land use to be simulated since the model will not support this scale of planning/targeting.

PRC: While the Phase 6 model may not support targeting at a local scale, some of the land use inputs to the model could informing local targeting. For example, high-resolution depiction of streams and parameterization of riparian buffer effectiveness based on flowpath analyses could help jurisdictions inventory and prioritize opportunities for restoration.

VA-DEQ: This *[considering whether the proposed sub-classes have water quality relevant characteristics unique from their parent land use]* seems to be a backwards way of doing this. Instead of developing a proposed land use and asking for a loadings justification why not look at the available data to see what land use loading characteristics exist that justify a unique land use to be simulated? Question if several of the proposed land uses can be justified based on loading characteristics or the proposed combination of land uses into a single one where we likely do have different known loading characteristics.

PRC: Tetra-Tech has compiled data on urban land use loading rates from the literature and local TMDLs. These data provide some justification for differentiating different land use loading rates, e.g., low-density residential from high-density residential and turf grass from open space. The Land Use Workgroup, Urban Stormwater Workgroup, Modeling Workgroup, and Tetra Tech will work towards synthesizing these findings over the coming months.

VA-DEQ: If at this point we do not know connectivity or if there is no or limited documented data to support connectivity across all land uses why is it being proposed?

PRC: Connectivity has been proposed as a modifier to impervious and pervious surface "land uses" as a means of differentiating the effects of dispersed rural impervious surfaces from concentrated urban impervious surfaces (many of which are connected to streams via stormwater conveyance systems). This was a topic of one of the Tracks at the recent STAC workshop on the "Peculiarities of Perviousness" (PoP). The CBP workgroups are still evaluating whether the scientific evidence is sufficient to use connectivity as a modifier or urban land uses.

VA-DEQ: Like urban tree canopy, riparian forest, beaches, regulated areas, or federal property boundaries? *[Related to: "Some potential land classes, such as low-density residential or protected forests, may be desired to inform various policy decisions or CBP Partnership commitments but are not relevant to estimating nutrient and sediment loads via the Phase 6 Watershed Model."]*

PRC: Beaches, regulated areas, and federal property boundaries have been proposed for management purposes. Urban tree canopy and riparian forests have been proposed due to their unique effects on nutrient loads.

VA-DEQ: This figure *[local data coverage]* includes Charlotte and Lunenburg Counties which according to CBP data have no loadings to the Bay. Why are they included? The other listed counties in VA all have at least some area of the locality draining to the Bay and are justified to be included.

PRC: We included all counties within and adjacent to the watershed in the Chesapeake Bay Land Change Model because growth in one county may impact growth in adjacent counties and to provide a regional context for land use along the boundary of the watershed. Land uses in jurisdictions fully outside the Bay watershed have never and will not be used in the calibration of the Watershed Model.

VA-DEQ: General comment on connectivity. Can HSPF really make this distinction since it does the calculations on a single acre of a land use and then multiplies the total area of that land use per segment to provide a loading from the aggreate land use for that segment. The model uses tablular land use information. The only real spatial distinction is on the segmentation but within a segment the land uses are essentially all connected.

PRC: Phase 6 will not simulate at a pixel scale but information on land uses and loads could be assembled at the pixel scale (external to the watershed model) and then aggregated to land-river segments as a separate loading rates for connected vs. disconnected impervious surfaces.

VA-DEQ: There appears to be considerable confusion as to what phase 6 will need in terms of land use information. Or worse conflicts within what is proposed. For example on page one of this document it states "Some potential land classes, … may be desired to inform various policy decisions or CBP Partnership commitments but are not relevant to estimating nutrient and sediment loads via the Phase 6 Watershed Model. **Such land uses should not be included in this list**." Yet land uses are proposed that should not be based on this statement. I do not see a polygon coverage being developed. Phase 6.x will operate off of a tabular land use that could originate from a polygon coverage but suspect tabular info from other sources such as NASS will be utilized over creation of separate land use polygons.

PRC: Some of the sub-classes were included in the list of proposed Phase 6 land uses to prompt discussion and consideration- erring on the side of inclusiveness at this stage of Phase 6 development.

VA-DEQ: It has not been demonstrated to this member of the LUWG, WTWG and Modeling WG that there is a difference that HSPF can simulate related to connectivity. HSPF basically treats all land uses as connected hydrologically. As mentioned in the individual comments floodplains, and riparian areas/corridors transcend land uses and would all be connected. So a land use classification system is needed to classify all land uses regardless of location. A floodplain layer could then be added to determine land uses within the floodplains assuming that a land use coverage with separate land use polygons was created. The important thing is the intersection of the land use with the floodplain assuming there is enough evidence to support floodplain loadings of the various land uses verses non floodplain versions of those land uses. And can HSPF truly deal with these nuances? If connectivity is an issue that can be supported with separate loading values for the land uses that are connected verses disconnected then this relationship should be established across all land uses not just urban ones.

PRC: If connectivity advances for further consideration following the STAC PoP workshop, a GIS flow path analysis could be applied to all land uses to evaluate their connectivity. It's clear from these questions that the CBP needs to do a better job communicating the land use compilation process. Some "land uses" such as federal lands and floodplains may just be overlays that are used to help parameterize the loading rates from other land uses- like impervious and pervious developed surfaces.

VA-DEQ: I do not support the Mixed Open category as described and defined. There are enough differences between the proposed sub-category land uses and their loading characteristics under that umbrella to justify separation.

PRC: This will surely be one of the more controversial proposed classes but it seems clear that some remainder class is needed. The remainder class (acres per jurisdiction remaining after accounting for water, urban, agriculture, and extractive) used to be "forests". For Phase 6, we're attempting to limit the remainder acres in a county to non-forest lands that are likely herbaceous or scrub-shrub. If we can make further distinctions within the Mixed Open we will but it is such a diverse and likely small (acreage wise) class and that finer distinctions may be challenging.

CBF: While "not relevant" to the Phase 6 Model, it *[land classes not relevant to estimating nutrient and sediment loads]* may well be relevant to future model versions, thus arguing for beginning to collect this information now. As discussed in the Chesapeake Bay Commission report, Crediting Conservation (June 2013), permanently protected forests may provide the kind of long-term assurance of "BMP" durability that is otherwise unavailable for BMPs contained within other land classes – where the attenuation of pollution from runoff is wholly dependent upon the application of BMPs whose life and long-term functionality is limited, and honestly uncertain. The permanence of the protective nature of forests impressed with perpetual conservation easements (especially those forests that are specially targeted for their high water quality values) may deserve some form of recognition in future models, such as providing a BMP credit multiplier of some sort. If this were accepted, capturing specific land use/land cover attributes (instead of just the generic "connected/disconnected" would become important.
Also, if/when the Model can recognize geographically specific lands and not just use generic loading rates for land use/land cover types, there will be a need for these data. It would be best to collect and have them now, so as to begin building that specific baseline.

PRC: The CBPO has committed to collecting and maintaining a database on protected/conserved lands for use by the CBP Partners. Land Use Workgroup is currently gathering local land use data for inclusion in the Phase 6 model and to conducting spatial analyses needed to refine the loading rates for land uses such as riparian forests. Phase 6 will remain a lumped parameter model that operates at the land-river segment scale. However, the data informing how land uses function within each land-river segment can be developed at a much finer resolution. At some point in the future, the watershed model itself may be a fully distributed model (e.g., 30m pixel scale) but that is currently not the plan for Phase 6.

II. DEVELOPED LAND COVER/USE

<u>Impervious surfaces</u>

VA-DEQ: Change name to "Disconnected Impervious Urban Surfaces". If farmsteads are to be a land use that have impervious surfaces then provide a distinction. Infrared spectral response for these land areas and farmsteads are essentially identical. Wondering how image processing software will distinguish? If we are defining connectivity below we need to specifically define these as disconnected.

CBF: For the reasons described in the comment above, I believe we should be capturing these different land uses *[potential sub-classes]*. As better and more spatially-refined, land use-specific data become available over following years, the Bay Model will hopefully be modified to be able to recognize and accommodate it.

Pervious developed surfaces
VA-DEQ: Change name to "Disconnected Pervious Urban Surfaces".

CBF: Include sub-classes

Dirt and Gravel Roads
VA-DEQ: Consider adding Connected vs Disconnected versions

VA-DEQ: CBP needs to provide the data that supports this statement *[Dirt and gravel roads have unique loading rates and BMPs].* I personally have not seen loadings data from enough places throughout the watershed to justify such a statement. Logging roads should be part of the disturbed or harvested forest land use. How long does a firebreak stay barren of vegetation? Question the ability to accurately identify these features with the imagery used. Question having this land use which likely is a very small overall acreage based on questionable information.

PRC: This class could also include pipelines. Some of the activities covered in this class may be included in Erosion and Sediment control permits.

Connected impervious surfaces (implies all other impervious surfaces are disconnected)
VA-DEQ: Where is the data supporting a loadings difference per acre for connected verses disconnected land uses. HSPF is a lumped parameter model that will simulate a single acre of each land use. An overall general average land use condition. How does this relate to the stream corridor, or floodplain proposed land uses? Won't all flood plains and stream corridors be connected and in some percentage pervious/impervious?

CBF: Include sub-classes

Connected pervious developed surfaces (implies all other pervious developed surfaces are disconnected)
CBF: Include sub-classes

PRC: Move institutional properties from Mixed Open to Pervious Developed.

Urban Tree Canopy

VA-DEQ: Consider adding Connected vs. Disconnected versions

VA-DEQ: Exactly what percent of the overall urban environment will this constitute? What about small areas of trees in the urban stream corridor?

VA-DEQ: If there is documentation of this *[tree canopy function resulting in reduced runoff volumes from developed surfaces]* then it would stand to reason it would have similar impacts on non developed land uses where there are small clusters of trees. Rural residential. Unsure if the the HSPF model can really simulate this accurately. I personally have not seen any studies demonstrating this. What I have seen is some effort related to reducing temperatures. Skeptical about the need for this as a land use.

CBF: Include sub-classes

Urban Stream Corridor

VA-DEQ: Clarify that this is assumed to be connected

VA-DEQ: Floodplains are a geologic feature that transcend source sectors and land uses. See comment about connectivity above. What stream network will be used in the p6 model? Or will any of these streams actually be simulated? If we are going down the path of floodplains, stream corridors, and connected land uses lets settle on a single set of criteria because these seem redundant. If we are going to identify urban corridors why not all riparian corridors. This really only works well if there are distinct land use polygons that allow the intersection of stream arcs with each land use polygon.

PRC: These are really important questions that we're struggling with. So far, consensus seems to be that we include 1:24K NHD-H streams as the stream layer used to map riparian areas, floodplains, and for calculating proximity to streams and that we use 10m hydrologically adjusted DEMs for flow path analyses. There is also consideration to parameterizing in-stream functions based on stream order, slope, catchment land use, etc. All of these characteristics can be identified and mapped but would have to be aggregated to land-river segment metrics to be of use in Phase 6.

Construction

VA-DEQ: Consider adding Connected vs. Disconnected versions

Extractive

VA-DEQ: Consider adding Connected vs. Disconnected versions

VA-DEQ: Most extraction as described is regulated to some extent or another.

CBF: Include sub-classes

Regulated Areas
VA-DEQ: Consider adding Connected vs. Disconnected versions

VA-DEQ: Regulated areas is not a land use. There are regulated areas that have land uses within their boundaries that will have different loading characteristics.

PRC: Future documentation will described regulated lands and federal properties as overlays, not land uses. We need to update our CSO/CSS coverage and then consider if/how this might affect the river segmentation in the model.

CBF: Include sub-classes

Federal Property Boundaries
VA-DEQ: Consider adding Connected vs. Disconnected versions

VA-DEQ: See comment above related to regulated areas.

CBF: Include sub-classes

Population on Sewer
VA-DEQ: Only as good as the available sewer system data. What about areas where this data is not available or sketchy?

PRC: We will revisit consideration of the 1990 Census as additional evidence for the presence of sewered areas.

Population on Septic
VA-DEQ: Consider adding Connected vs. Disconnected versions

PRC: As was done with Maryland, distance to streams could be used as a modifier to soil attenuation rates. This will be considered by an upcoming expert panel on septic attenuation. We will use local/state submissions of septic counts to refine our estimates. Some sub-classes- like shall drain fields and failing systems- will be considered by the upcoming expert panel on septic attenuation.

CBF: Include sub-classes

III. NATURAL LAND COVER/USE

Forest
VA-DEQ: Consider adding Connected vs. Disconnected versions

Disturbed Forest
VA-DEQ: Consider adding Connected vs. Disconnected versions

VA-DEQ: But we are proposing to have logging roads separated out of these areas?

VA-DEQ: The states have been reporting FHP acres for years. Can't that information be used to estimate harvesting over an assumed static amount as proposed? Propose an analysis of past reporting be provided to the LUWG.

PRC: Agreed, it would be nice to have monitoring data informing the estimate of disturbed acres where it exists. Harvested forest should be a separate class from defoliated forest.

CBF: Include sub-classes

Mixed Open (rural herbaceous/ scrub-shrub/ small-patch tree canopy)
VA-DEQ: Question the ability of determining idle land, rural landfills, and cemeteries from the imagery. Rural institutional lands will look much like large farmsteads. Generally speaking if we are going worry about hydrologic connectivity why worry about the disconnected areas? It is doubtful that all of the various land uses described within this overall classification have similar loadings characteristics. It is a bad assumption to think rural institutional lands are not fertilizing their lawn areas. Assume that when agricultural land is reported to be put into retirement it will get this land use loading. Exactly what will the justification for these varied loading sources to be averaged into a single "descriptive" set of loadings?

PRC: All of the land uses proposed for Phase 6 will be mapped using an assemblage of different data types (e.g., remote sensing, planimetric, terrain analysis, and various national polygon datasets that include classes such as "institutional"). Because institutional properties are more likely to be fertilized than not, they should be mapped as pervious developed. This class may also include right-of-ways and transmission lines.

CBF: Include sub-classes

Floodplains
VA-DEQ: Clarify that this is assumed to be connected

VA-DEQ: Again floodplains transcend all land uses and all streams have floodplain areas. Again seem to be duplicative of connected land uses, stream corridors, riparian forests, and wetlands which are also in or around floodplains.

PRC: Floodplains will be referred to as an "overlay" in future land use documentation. They will be useful for parameterizing sediment delivery and could serve to augment upstream sediment loads from all land uses.

Riparian Forests

VA-DEQ: Clarify that this is assumed to be connected

VA-DEQ: And what about the studies showing forested buffers adding loadings to the steams? This *[riparian buffers trapping sediment associated with flood flows]* depends a lot on the soils, connectivity of the root zone to the water table, floodplain characteristics, available carbon, and many other factors other than the vegetation growing adjacent to the stream. Looks similar to urban stream corridor effort. Needs to be done for all land use types if at all. Are we tricking ourselves to think the regional scale model phase 6 will be can distinguish things at this scale?

PRC: We are considering using the analyses published by Weller et al., 2011 and Baker et al., 2006 to inform the potential functioning of riparian forest buffers. We will also consider hydrogeologic conditions on the eastern shore which, as you suggest, serve to route flow under the root zone of riparian zones in some areas.

Baker, M. E., Weller, D. E., & Jordan, T. E. (2006). Improved methods for quantifying potential nutrient interception by riparian buffers. *Landscape Ecology*, *21*(8), 1327-1345.

Weller, D. E., Baker, M. E., & Jordan, T. E. (2011). Effects of riparian buffers on nitrate concentrations in watershed discharges: new models and management implications. *Ecological Applications*, *21*(5), 1679-1695.

CBF: Include sub-classes

Wetlands

VA-DEQ: Clarify that this is assumed to be connected

PRC: Some wetland classes such as tidal wetlands- might be more appropriate for inclusion in the estuarine model rather than in the watershed model.

CBF: Include sub-classes

Open Water

VA-DEQ: Clarify that this is assumed to be connected

PRC: If this should include stream area for atmospheric deposition we will need to infer stream widths from drainage area, stream order, or digital elevation models.

CBF: Include sub-classes

Beaches

VA-DEQ: Clarify that this is assumed to be connected

VA-DEQ: Mean high tide or mean low tide. Based on this proposed land use being adjacent to the tidal water and is tidally influenced what benefit to explicitly including them? Are there

BMPs applied to these areas? All loadings would be 100% delivered. Do not see a benefit of having this land use simulated.

PRC: We will lump Beaches in with Open Water.

CBF: Include sub-classes

IV. AGRICULTURAL LAND USES

Farmsteads

VA-DEQ: Consider adding Connected vs. Disconnected versions

VA-DEQ: Unless there is evidence of unique loading characteristics already on hand why propose such a land use. We should only have land uses in the WSM that we already have data to support there being a difference justifying a unique land use simulation.

CBF: While this land use may be found, generally, within "disconnected impervious," again, I feel that losing granularity would be a mistake, especially if changes to the Model in the future can make the higher gain more useful. I think the Program should try to capture the detail now, to the extent reasonably possible. *[Referencing the farmstead potential subclasses]*

Cropland

VA-DEQ: Consider adding Connected vs. Disconnected versions

Pasture

VA-DEQ: Consider adding Connected vs. Disconnected versions

VA-DEQ: Nat all pastures are treated the same. There are managed pastures that are getting fertilized, limed, plus animal manures to include poultry and dairy manure applications. There are also pasture areas that are not managed and only grazed occasionally. There are poorly managed pastures that can be overgrazed.

VA-DEQ: Verses producing a polygonal coverage of all land uses. NASS Census is not actually a Census but more of a survey that is statistically manipulated. *[Related to using CoA, NASS and Cropland Data Layer for mapping]*

Legume and Other Forage

VA-DEQ: Change name to "Forages Connected vs. Disconnected"

VA-DEQ: Consider large acreages of Virginia's pastures are also hayed. Meaning farmers get 1 or 2 cuttings of hay from those pastures annually. How do we differentiate hay/pasture arreas from this proposed forage category?

Nurseries, Orchards, and Sod farms

VA-DEQ: Consider adding Connected vs. Disconnected versions

VA-DEQ: So why lump them together? They do not get the same BMPs. This justifies separate land uses. Do not agree Christmass Tree Farms should be included with Orchards. *[Related to: nurseries, orchards and sod farms having unique loads and unique management characteristics]*

Idle/Fallow Agricultural Land

VA-DEQ: Consider adding Connected vs. Disconnected versions

VA-DEQ: Suggest pulling this out of Mixed Open if it is to be simulated.

VA-DEQ: I do not see this providing an accurate determination of this land use. What about the large acreages of tobacco that went into idle status. Similar with peanuts as subsidies declined so did the acreages planted. So some amount of fallow or idle land originates from cropland not pasture. *[Related to using annual NASS data to determine annual variation in idle/fallow area between census years]*

Additional comments from James-Davis Martin

I would like to propose an alternative approach to the Phase 6 landuse. The approach would differentiate between the land use/land cover classifications and management considerations associated with the land uses.

I would recommend the following land use classifications:

Category	**Source**	**Land Use/Land Cover**
Natural	Forest	Forest
Natural	Forest	Disturbed Forest (selective harvest, damaged)
Natural	Wetland	Vegetated Wetland
Natural	Wetland	Non-Vegetated Wetland (beach, mud flat)
Natural	Mixed Open	Mixed Open
Natural	Water	Stream/River
Natural	Water	Reservoir/Lake/Pond
Agriculture	Crop	Orchard/Grove/Vineyard
Agriculture	Hay	Alfalfa
Agriculture	Hay	Hay
Agriculture	Pasture	Pasture
Agriculture	Forest	Harvested Forest
Agriculture	Crop	Row Crop
Agriculture	Crop	Specialty Crop/Sod
Agriculture	Animal	Confined Animal Operations
Agriculture	Nursery/Greenhouse	Nursery/Greenhouse
Developed	Pervious	Other Pervious
Developed	Pervious	High Turf (Golf Courses, Ball Fields, Cemeteries,

		parade/drill/event fields)
Developed	Impervious	Other Impervious
Transportation	Impervious	Roads/Runways
Transportation	Dirt and Gravel Roads/Rail beds	Dirt and Gravel Roads/Rail beds
Barren	Construction	Construction
Barren	Extractive	Extractive (active or abandoned)
Onsite	Septic	N/A
Wastewater	Industrial	N/A
Wastewater	STP	N/A

This approach expands several of the lumped categories in the Proposed Phase 6 land uses because I believe there is sufficient difference in the loading characteristics.

Impervious surfaces	Roads/Runways
	Other Impervious
Pervious developed surfaces	Pervious
	High Turf
Disturbed Forest	Harvested Forest
	Disturbed Forest
Open Water	Stream/River
	Reservoir/Lake/Pond
Legume and Other Forage	Alfalfa
	Hay
Nurseries, Orchards, and Sod farms Wetlands	Orchard/Grove/Vineyard
	Nursery/Greenhouse
	Specialty Crop/Sod
Wetland and Beach	Vegetated Wetland
	Non-Vegetated Wetland

Additionally, each of the land uses could have the appropriate combination of the following management considerations associated with them:

Ownership/Control	**Regulated**	**Riparian Corridor**	**Protection**
Private/Unknown	No	No	No
Federal (Agency Code)	Phase 1 MS4	Channel	Protected
State (State Code)	Phase 2 MS4	Floodplain	
Municipal (FIPS)	CSS	Corridor	
	CAFO		
	Industrial SW		
	Construction		

This combination of land use and management considerations would allow for improved resolution in planning and targeting BMPs and improved tracking and accountability of loads. The approach also allows for tracking of several habitat related outcomes contained in the new Bay Agreement while maintaining a focus on water quality.

This approach also addresses all of the categories that were included in the proposed Phase 6 land use list. Below is a crosswalk:

Phase 6 Proposed	**Land Use/Land Cover**	**Management Consideration**
Impervious surfaces	Roads/Runways	
	Other Impervious	
Pervious developed surfaces	Pervious	
	High Turf	
Dirt and Gravel Roads	Dirt and Gravel Roads/Rail beds	
Connected impervious surfaces	Roads/Runways	Riparian Corridor - Floodplain or Corridor
	Other Impervious	Riparian Corridor - Floodplain or Corridor
Connected pervious developed surfaces	Pervious	Riparian Corridor - Floodplain or Corridor
	High Turf	Riparian Corridor - Floodplain or Corridor
Urban Tree Canopy	Forest	
	Mixed Open	
	Pervious (w/ BMP)	
	High Turf (w/ BMP)	
	Other Impervious (w/ BMP)	
Urban Stream Corridor	Roads/Runways	Riparian Corridor - Floodplain or Corridor
	Other Impervious	Riparian Corridor - Floodplain or Corridor
	Pervious	Riparian Corridor - Floodplain or Corridor
	High Turf	Riparian Corridor - Floodplain or Corridor
	Vegetated Wetland	Riparian Corridor - Floodplain or Corridor
	Forest	Riparian Corridor - Floodplain or Corridor
	Mixed Open	Riparian Corridor - Floodplain or Corridor
	Stream/River	Riparian Corridor - Channel
Construction	Construction	
Extractive	Extractive	
Forest	Forest	
Disturbed Forest	Harvested Forest	
	Disturbed Forest	
Mixed Open	Mixed Open	
Floodplains	Forest	Riparian Corridor - Floodplain
	Harvested Forest	Riparian Corridor - Floodplain
	Disturbed Forest	Riparian Corridor - Floodplain
	Mixed Open	Riparian Corridor - Floodplain
	Vegetated Wetland	Riparian Corridor - Floodplain

	Row Crop	Riparian Corridor - Floodplain
	Pasture	Riparian Corridor - Floodplain
	Alfalfa	Riparian Corridor - Floodplain
	Hay	Riparian Corridor - Floodplain
Riparian Forests	Forest	Riparian Corridor - Corridor
	Harvested Forest	Riparian Corridor - Corridor
	Disturbed Forest	Riparian Corridor - Corridor
Wetlands	Vegetated Wetland	
	Non-Vegetated Wetland	
Open Water	Stream/River	
	Reservoir/Lake/Pond	
Beaches	Non-Vegetated Wetland	
Farmsteads	Confined Animal Operations	
Cropland	Row Crop	
Pasture	Pasture	
Legume and Other Forage	Alfalfa	
	Hay	
Nurseries, Orchards, and Sod farms	Orchard/Grove/Vineyard	
	Nursery/Greenhouse	
	Specialty Crop/Sod	
Idle/Fallow Agricultural Land	Mixed Open	
Regulated Areas	Any Landuse	Regulated - Any Classification
Federal Property Boundaries	Any Landuse	Ownership - Federal
Population on Sewer	Not a Landuse	
Population on Septic	Not a Landuse	