General Resident Questions:

1. How can a drastic change to Monocacy Hill be avoided?

The best way of avoiding a drastic change would be to start small with implementation and possibly delay the various activities in the 10-year plan as needed. As you will see, in the next 10 years not all the proposed stands that could have timber harvested are listed. This is specifically to ensure that what unit(s) are managed are properly accounted for prior to completing another stand or stands. This plan was consolidated into 10 years, but the activities could be spread out further into a 20-year period etc. This would reduce the overall impact to the property with a check and balance to the first stand or stands that would receive management. Stand 1 is listed first in the schedule of activities as we feel it is a good starting point that encompasses much of what "could" occur to the other stands without making a drastic change.

2. Plan includes responses from 2 PA agencies – were these considered when developing the plan?

Yes, the PNDI is a tool that is used to detect possible threatened and endangered species. All information was submitted into the U.S. Fish and Wildlife Service's IPaC program for each of the threatened species listen under that agency. These threatened species are common PNDI hits that we come across regularly. Most of these species are affected by forest fragmentation caused by infrastructure development such as housing developments. Tree species that these bats use as mating habitat will remain. Caves and rocky outcrops will be avoided. These mostly apply to Stand 10 where logging activities are not possible. The bog turtle, if home to the hill, would be located in Stand 11 as that is its most preferred habitat which is not a unit receiving timber harvesting operations. This stand is a buffer strip and shall be a natural area as the spring is an important resource to the property.

3. Plan includes recommendations from the 2009 report by Natural Land Trust – have these been addressed?

Yes, I would agree for the most part. We were never given a copy of that plan to refer to but this plan meets and exceeds all requirements needed for PA forest stewardship plans, Family Forest Carbon Program and the CPA-106 & DIA-165 forest management plan used by NRCS which is a

cost share program used by private landowners. So most if not all resource concerns should be addressed or discussed.

4. If the plan moves forward – how or who would monitor it?

We can continue to monitor its progress even if we are not completing all the forest implementation. We are capable of doing most of the activities listed in the schedule. The township may be able to outsource PA DCNR oversight as a third-party member to ensure proper management is taking place. The PA DCNR service forester for the area is John Nissen.

5. Relative to herbicide treatment – will this be safe for wildlife and other plants, hikers, pets, etc? And what is the plan for on-going maintenance.

Herbicide treatments are a safe process overall when the chemicals are used per the chemical label which is the law. Signage and postings of when treatments are taking place are recommended to inform the public when and where invasive management is taking place. The duration should be a few days depending on the acreage. The chemicals will not affect wildlife, pets or visitors' post treatment. So, access could be granted the day after treatment is complete. Invasive control is never-ending so as long as the invasives meet an observation percent cover of less than 10% across a unit then it is considered highly controlled. Spot treatments can be used after the initial normal 3 treatments when populations are very high. Most woody populations should be controlled within 2 applications.

6. Would hiking trails be used as skid roads to remove logs?

This should be based on the condition of the individual hiking trail itself in my opinion. If the trail is in great condition and it would not be beneficial to use it as a skid trail then in the contract with a logger, they must obey that clause and can only cross the trail if needed not skid on it directly. Site retirement will be crucial in assuring the trails, where intersected, are returned to their current conditions preharvest. If the trail needs rehabilitation, it may be in the best interest to use the trail and upon site retirement would be graded, seeded, and water control measurements taken (water bars installed) which then would improve the trails condition overall. Tyler can attest to our timber conveyance contracts and the requirements that must be met before the job is completed.

7. Could you describe the process of Forestry Mulching

Forestry mulching is used when there is a high population of very large invasive plants like bush honeysuckle (Vegetative wall of invasives and hard to walk through). It is more cost effective to mulch the area since it may take many foliar applications (4 or more) to effectively kill the large bushes and the population. The mulcher will masticate the invasives to the ground. One or two follows up foliar herbicide treatment will then be completed to the stump shoots that may resprout to effectively kill the invasives. At this point the effectiveness

of the chemical is much higher as the invasive is reduced to just the roots and a small shoot from the root ball. Mulching is very effective in large populations of very large woody brush such as in stand 9 and a portion of stand 1 as outlined in the plan.

8. How wide is the stream buffer in Stand 11?

Stand 11 is the stream buffer itself and will not receive any harvesting. Invasive management can be implemented using aquatically labeled herbicides. The average width of that stand is 200ft with the spring being centered around that equaling 100ft of buffer area on each side. The site conditions may also increase that width as well due to the topography/ rockiness.

9. Relative to Income – what is the cost of the timbering to achieve the revenues outlined?

   Also, what is the cost of the invasives work, monitoring and restoration – ie: what would the Net Income look like?

The timber stand values are based on a median representation of what may be incurred if the stand was completely clearcut hence the total liquidation. These values are relative and should be taken with a grain of salt since the timber market is consistently fluctuating. I can positively assure that there would be a net gain even after invasive management. Tyler can discuss our rates for invasive management work and invasive contracting; foliar treatment, preemergent treatment, basal treatment, and hack n squirt. Depending on the severity of the job if our equipment is not sufficient, we do have the ability to outsource a separate contractor in which we would under contract/oversee the operation for the township to ensure proper applications and kill is met.

10. Could you provide an estimate on the percentage of trees that would be removed from a stand under the two methods outlined (Shelterwood & Crop Release)?

This varies depending on the specific site conditions. In a shelterwood method which is 2 stages the first would remove the suppressed/intermediate trees in the stand which may make up to 30-40% of the trees depending on the stocking. If the basal area is high (130ft/ac >) then more trees can be removed without causing harm to the forest stand. The second stage as described in the plan IF DESIRED would then go back in to remove most of the overstory to release the established regeneration. THIS ONLY OCCURS WHEN ADAQUATE DESIRED REGEN IS ESTABLISHED. At this point majority of the canopy is removed leaving only wildlife trees (dead snags or cavity trees) and a few heathy old growth trees. A crop tree release would reduce the canopy by about 30-60% leaving the most suitable trees that have the best characteristics for continued growth and mast production. Refer to the pictures in the plan where the descriptions are located. These were recently taken on Hanover Bourgh Property in Hanover PA this past year.

11. With the deer population being close to capacity – why are you recommending food plots for them?

Food plots are not directly recommended specifically for deer but various wildlife in the area that may benefit from herbaceous openings. Deer do benefit and may make it easier for hunters to harvest game as well. This also relieves some competition for the establishing regeneration as it provides another source of food for deer. The best options for these would be skid trails, large canopy openings from natural tree mortality and log landings. Again, it is not required but can enhance the wildlife habitat on the property while reducing soil erosion and invasive establishment. We highly encourage hunting to reduce the doe populations which will increase the chances for oak regeneration to establish.

12. How long would it take to re-grow a stand after timbering?

A rotation would occur with a shelterwood method so after the first harvest another can be completed possibly within 4-7 years after the first stage depending on the regeneration. At that point it would be left alone for about 20 years till that stand would be old enough for a Forest Stand Improvement with pulpwood sized trees 6-8 inches that can be thinned commercially. A productive site with good soil conditions like what is on the hill can produce a sawtimber sized tree (14”dbh) in about 50-60 years.

13. Is preservation of existing flora and fauna species being considered?

Yes, woody invasive species are managed with a foliar application in the summer which at that point most of the spring ephemerals are done their life cycle. A preemergent chemical to control the herbaceous invasives is applied in the early spring before germination and certain herbicides would be recommend over others such as permethrin as it is more species specific and does not impact native plants as much as others like oust xp. You will find most populations of the plants in the understory are invasive since the past 40 years they have overtaken native populations in certain areas especially those that used to be open pasture.

14. What is the impact to vulnerable and declining box turtle population?

Refer to the previous question relating to the PNDI.

15. How would logging impact the ecosystems of the Hill and water drainage in the area?

Logging, when properly done, impacts the landscape positively overall. A closed canopy open understory provides very little benefits to wildlife overall. Habitats need open space for native herbaceous and woody plants to establish in the understory which creates habitat and provides more food per acre than the current conditions. The understory is mostly invasives which do not provide any benefits to wildlife. Stratification of the forest canopy is needed to achieve ecological functions that various wildlife depends on.

16. What precautions would be taken to ensure our ground water and surface water are not compromised?

Proper Best Management Practices (BMP's) will be used to the full extent. This includes buffers to sensitive areas, proper site retirement that includes water bars, dug outs, seeding trails/landing areas and installing filter strips when needed. Monitoring logging operations through weekly audits will ensure that the contractors are treating the land with due care and if not penalties or fines may be used.

17. Is there a replanting plan as part of a total healthy forest conservation plan?

Tree planting is an option but was not included as natural regeneration should establish well since the soil conditions are relatively good. Areas that receive forestry mulching would be prime candidates for artificial tree planting. Trees should be tubed as well to protect them from deer browse. Can be reviewed further, however it is very costly.

18. How would mitigation of fire spread be handled?

Wildfire threats are low to moderate overall. Most likely cause is due to lightning strikes during dry periods. Establishing trails (from logging) and using existing trails as fire breaks in the event of a fire is highly recommended. To mitigate fire spread. Dead and dying trees would be removed during any timber harvest to reduce fuel loads. Slash and tops may seem of concern but they breakdown relatively quick within 3-5 years.

John's Questions:

1. What do the following Forest Type codes mean: TM 11, AR 11, AD 11, EV16, AH31, UA11.

They represent a code for the forest type and are understood in the Pennsylvania Timber Typing Manual. The letters stand for the forest type itself (ex. TM = Tulip tree - (Beech) - Maple Forest) which is named in the general description above the 4 stand pictures. The second number represents the site conditions based on tree heights. Site 1: Characterized by moist, well-drained, fairly deep soils that usually occur in protected coves, along streams, or in bottomlands that remain moist throughout the year. On northern exposures, Site 1 may extend higher up a slope than on southern exposures because of more favorable soil moisture conditions. In addition to the usual beech-birch-maple cherry of northern and Allegheny hardwoods, white pine, hemlock, ash and basswood are generally present. In the oak types where red oak and white oak along with hemlock form the major portion of the stand, the presence of tulip tree (yellow poplar) and ash indicates Site 1. Dominant and co-dominant trees have a projected merchantable main stem of > 50 feet at maturity (> three 16-foot logs). Total tree heights average > 80 feet at maturity. Site 2: Characterized by soil intermediate in moisture, depth, drainage and fertility that may dry-out for short periods during the year.

Usually located on slopes between the ridge tops and the coves and bottomlands. In the northern and Allegheny hardwood types, Site 2 is primarily a beech-birch maple-cherry

mixture with shorter heights than on site 1. In the oak types, site 2 has a preponderance of red oak, black oak, white oak and, to a lesser extent, scarlet oak and chestnut oak. Dominant and co-dominant trees have a projected merchantable main stem of 30-40 feet at maturity (2-2½ 16 foot logs). Total tree heights average > 65 feet but < 80 feet at maturity. Site 3: Characterized by shallow, rather dry, stony or compact soils which usually occur on ridges or broad flat plateaus. Dominant and co-dominant trees have a projected main stem less than 30 feet at maturity (< two 16 foot logs). Pitch pine and white pine may yield 30+ feet of projected main stem at maturity (two 16-foot logs). Total tree heights average < 65 feet at maturity. The last number represents the stocking class and tree size based on the diameter of the dominate and codominant trees in the stand.

1 Majority of the dominant and co-dominant trees are > 18" Dbh and > 50% stocked.

2 Majority of the dominant and co-dominant trees are12-18" Dbh and > 50% stocked.

3 Majority of the dominant and co-dominant trees are 6-12" Dbh and > 50% stocked.

4 Majority of dominant and co-dominant trees are < 6" Dbh and > 50% stocked.

5 Majority of the dominant and co-dominant trees are > 18" Dbh and < 50% stocked.

6 Majority of the dominant and co-dominant trees are12-18" Dbh and < 50% stocked.

7 Majority of the dominant and co-dominant trees are 6-12" Dbh and < 50% stocked.

8 Majority of dominant and co-dominant trees are < 6" Dbh and < 50% stocked.

Size/stocking classes 5 through 8 are to be used for areas that have experienced heavy mortality and are grossly understocked. Use the fifty-percent stocking line on the oak-stocking chart as a guide for determining whether or not an area should be designated as understocked. Appropriate stocking charts can be referenced to determine basal area / stocking equivalents. Total species composition should be used to determine stocking levels.

2. Explain the site charts of columns and rows for Stand Basal Area, Trees per Acre, and Total, Volume by DBH. Specifically, the horizontal line of 'Total' under the bar graph.

Tyler will explain during meeting.

3. Form NRCS-CPA-6 under "Listed possible alternative resource management system the NRCS Conservationist might consider with the land user" it is stated access improvements and new trails to be established. Why and where are new trails going to be established?

New trails may be established due to logging purposes but can also be used recreationally if not let go to be converted back to natural forest. This can be site dependent and determined when skid trails are laid out/established.

4. The 'Forest Management Conservation Planning Activity, Monocacy Hill Recreation Area' on Form NTRC-CPA-6 of the Current Conservation Objectives, since there is no number 3 in the order of 1-4; is it to be understood "Identify and efficiently control the invasive plant population that occur on the property" should be labelled as number **3?**

Yes, John is correct. That is a typo and will be fixed!

4. PNHP Significance Rank: State, lists on page 33, "Invasive species removal efforts should focus on reducing the prevalence of woody species such as Norway Maple, Japanese Barberry, common privet, bush honeysuckle, Japanese honeysuckle, multiflora rose, autumn olive, and winged euonymus." Why throughout the report of all the site location there is no mention of Norway Maple being invasive nor an established tree?

Risa pointed this out and will be fixed when she sends us a list of other invasives. When conducting the inventory some invasives were not noticed or recorded in our data.

a. Are there other invasive plants in the area not listed in the report, (i.e. Bradford Pear,

Poison Ivy, garlic mustard)? Yes, Risa has a list for us to include others missed.

b. Is economical and feasible to mechanically to removing invasive species in small areas

as not to poison the soil biological diversity? Yes, there are large areas with invasive populations that could use a broadcast spray. Drift or application to native plants is possible and does occur when this form of application takes place, but it is the most effective way to reset the stand if the populations are high. Other forms of applications such as hack and squirt and basal applications are species specific and do not cause harm to surrounding vegetation. This works best with Norway maple, ailanthus, and large individual bushes of autumn olive/ bush honeysuckle etc.

c. When is the recommended time to remove invasive species, before or after tree

harvesting? Woody invasives prior to timber harvesting (multiflora rose, bush honeysuckle, barberry, wineberry, ailanthus etc.) Herbaceous invasives can be controlled post harvesting (Stilt grass, Mile a minute, garlic mustard etc.

d. What is done with the invasive waste?

The dead invasives will decompose naturally and add nutrients to the soil horizon. Most will be crushed if logging occurs.

What are the <u>costs</u> associated with the various methods of invasive species removal?

Tyler will discuss this with the township.

6. The Timber Value for each site gives a dollar amount. Are these figures based on **gross** income or **net** income**?** This is gross income, but there will be sufficient net income. Again, these are median liquidation values and do not reflect the earnings from an individually bid timber sale which may be valued less or more based on the sawlog volumes and pulpwood tonnages after 100% tallying the trees to be harvested. Market prices and other factors will decrease or increase bid amounts.

a. **Are the income** calculations based on **clear** cut or select cut**?** Median values of the stand being clearcut.

b. If you calculated the **income** on clear cut, then what would be the estimated income from

select cut**?** It is very difficult to determine unless volumes were calculated after timber marking. Values are heavily based on species**.**

7. How **big** are log landings and **skid** trails**?**

Log landings on average are ¼ acre or less skid trails are about 10-15 feet wide depending on the equipment being used.

8. **Why** should food plots be established when the deer **impact** is moderate **on** the property **and is** close to reaching its **limit**? Food plots for deer **encourage** more **deer** hence when the food **plots** are **exhausted desirable** vegetation **is** destroyed by **the** deer. Added deer **to** the area increases potential automobile accidents **and** landscape destruction **to** neighboring properties. Since the report indicates the deer population is **moderate** and close **to** reaching **its** limit the science shows the average doe has on to two fawns per year**;** the declining number of **hunters**, as **per** the PA Game Commission**,** and **with the surrounding** rural area **it** would appear the **deer** population **should remain** steady without food plots. However, the seeding and planting of beneficial vegetation for pollinators should be encouraged.

Agreed, deer management is as important if not more than invasive species management. Refer to Nates #11 for reasons for herbaceous opening establishment. We are referring more to linear food plots using skid trails as the base for them. Can be as simple as having loggers seeding contractor grade grass or delineating areas for increased pollinator habitat using other seed that can be purchased from the revenue generated from timber harvesting.

Linda's Questions:

1. How do you see this impacting both bird nesting sites and wildlife habitats? To produce any significant revenue from logging, I would assume you will be targeting the old growth trees. Has consideration been given as to how logging will change the dynamics of the hill. We have already lost a great deal of our bird population due to changing environmental factors. With many bird species requiring interior forest areas, we could be

disturbing or destroying their annual nesting sites as well as disrupting other wildlife that call Monocacy Hill home.

We understand the concern! When we utilize proper silvicultural harvesting techniques such as shelterwood harvesting and crop tree release we actually benefit many songbird species that are in decline. The goal is to not fragment the hill and lose the benefits that a forested ecosystem provides but to stratify the habitat in the understory, midstory and overstory canopies. A diverse ecosystem helps support many specific needs that a variety of birds need. An example. Trees that are dead and full of woodpecker holes would be left as wildlife trees as it supports many animals. Trees that are hollow will remain uncut as they provide shelter for squirrel, racoon, fox and birds. We are fully against high grading timber which basically lack of better words, rapes the forest of the best quality trees just to make a dollar. The goal of this plan is to benefit wildlife, reduce invasive populations, and increase the hills recreational opportunities. Periodic revenue is and should be a byproduct of properly managing forested land but as seen in the list of management goals and objectives is last on the list for a reason.

2. Over the years, MHCA has done a lot of work to protect and catalog the wildflower species on the Hill, some of which are vulnerable species. Are you aware of these species and is any consideration being given to create buffer zones to protect our wildflower population?

Yes, the PNDI response named a few. We are certainly interested to hear about others and where they are located to avoid spraying these areas as invasive management would be the highest likelihood of reducing their populations.

3. Assuming heavy equipment will be needed to do logging, new trails may need to be widened, and possibly new ones created, to access specific stands of trees. With the creation of new open spaces, there is great potential for the spread of invasives that MHCA has spent years trying to control. Will there be any remediation to prevent the spread of invasives that are already hard to control?

Yes, certainly all invasives will be managed appropriately. There is a threshold at which to achieve 10% or less percent cover of woody invasive plants prior to opening the forest canopy. Eradication on invasive plants is impossible however at a light population native tree species have the ability to outcompete them and eventually shade them out, which is the goal as the new cohort of trees reach a stem exclusion phase. Trails and their edges are recommended to be seeded with native grasses and Forbes to reduce soil erosion and invasive establishment.

4. Having always lived at the base of Monocacy Hill, I know when the hill was logged many years ago, new runoffs occurred that changed drainage coming off the hill. Are drainage issues being considered?
   Living at the base of the hill, we already have very wet yard conditions in the rainy Spring months so I'm concerned whether any disturbances will cause new water drainage

issues. Also, there have always been areas of the hill where trails required water bars to keep them usable.

Water management will be considered upon if and when timber operations commence. Proper uses of BMP's will be used as well as all harvesting operations require an Erosion and Sedimentation Plan (E&S Plan) prior to timber harvesting. This plan would be written by us to ensure proper features such as water bars, dug outs, culverts and filter strips are placed during operations as well as in the site retirement. We also have the authority to keep loggers off the property if conditions are not favorable to actively harvest. This will reduce the compaction, rutting and water runoff that would otherwise be overlooked.

5. With so much dead wood already on the ground, is there any forestry mulching or some kind of forestry process that would help mitigate the concern of fire spread (heaven forbid)?

Yes, the amount of dead ash on the ground is a concern and could be possibly merchandised by loggers if a timber operation was enacted. We can mark them as cull or pulpwood to be extracted which the logger would merchandise the trees into firewood. This would reduce the fuel load on the ground. Tree slash and tops may also be a concern, but they decompose relatively quick within 5 years and help return nutrients back into the soil horizon. Mulching can be done to these tops, but it is not recommended as tree tops provide wildlife habitat as well as protection to new seedlings from deer browse.

6. If, in fact, this logging project is passed, how much revenue is projected in each stage of the process and how long will each project take to complete? It is stated this project would be in stages over a 10-year period. Would only sections of the park be inaccessible when work is being done, or would the entire park need to be closed for certain periods of time?

The first stage of a shelterwood does not produce as much revenue as an overstory removal however most of the trees located on the property that would be considered junk or not as profitable are very large pulpwood size to mostly sawlog size which benefits the initial harvest profits because you can get sawlogs out of the undesired trees within the stand. With the plan being split into various stands which do not equate to more than 50 acres at a time, a logging crew should on average be completed with the job in a month or two. At that time signage should be posted around the timber sale boundary to alert the public that there is an active logging operation occurring and this portion of the property should be off limits while the crew is **present**. The entire park should never be shut down at any time. The breakdown of the schedule can be lengthened between implementations of the stands as well. We do consider invasive management to be the priority to maintain as scheduled.