

Economic Analysis of the 2006 Wayne National Forest Plan

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Introduction, Summary, and Recommendations

1. Introduction

This White Paper, developed by GreenFire Consulting Group, LLC and commissioned by Heartwood, contains a comprehensive economic analysis of public benefits and costs from the Forest Service's 2006 Plan for managing the Wayne National Forest (WNF) over the next 10 years.

The WNF has the potential to become the jewel of southeastern Ohio. Covering 238,000 acres of unglaciated Ohio hill country, it is the only national forest in the entire state. About 12 million people live within 100 miles of the Wayne. Ohio ranks seventh among the states in population but only 47th in public lands (Federal and State) per capita.

Yet under the management of the USDA Forest Service, the WNF has continued to be a sacrifice zone for extractive industries, including logging, strip mining, oil and gas drilling. Its hills are scarred with clearcuts, crisscrossed with power lines, torn up by ORVs, and the water flowing through its creeks and rivers is tinted orange with mining waste.

The WNF, managed for its highest values — water filtration and flow regulation, air purification, tourism, biodiversity and carbon sequestration — could become a great natural asset to the State of Ohio and to the nation. Yet, by implementing the 2006 WNF Plan, the Forest Service continues to degrade and diminish this natural asset. The 2006 WNF Plan has declared 161,752 acres—almost 70 percent of the WNF area—as suitable for timber production and proposes to log 18,441 acres over the next decade—not including salvage logging. In addition, the Forest Service plans to burn 46,215 acres for an unproven “oak regeneration” program and 21,904 acres to reduce questionable “hazardous fuels” risks. Almost 11,000 acres of forest land may be

sprayed with herbicides, 1,250 acres opened to surface coal mining, and 121 acres to oil and gas well development. We may see about 180 miles of new temporary and permanent roads.

The sum of extractive and destructive activities proposed in the 2006 Forest Plan will lessen the attractiveness of the forest and will negatively impact tourism. They will also diminish the capacity of the WNF to deliver “ecosystem services” such as water purification performed by the natural filtration systems of the earth and carbon sequestration provided by the trees and other forest plants. These ecosystem services have a much higher value to society than the timber that is taken out.

In addition, cutting timber, digging for minerals, drilling for natural gas, and building ORV trails costs more in purely financial terms than what the Forest Service receives in revenues from those activities. Consequently, they create a financial loss to the taxpayer. The Forest Service justifies this double-negative with supposed benefits of “ecosystem management,” “oil independence,” and “tourism niche marketing,” as well as benefits to the local economy.

However, as our analysis shows, it is questionable whether the 2006 WNF’s Land and Resources Management Plan (LRMP) provides any net benefits to the public.

The failure of the Forest Service to manage the WNF according to what would maximize net public benefits is rooted in a system of financial incentives established by Congress. This system of incentives is operative in other national forests as well. Since the failure of the WNF Plan to maximize net public benefits derives directly from Congress, only Congress, through the urging and support of the citizens of the United States, can fix it.

We hope to move this process along by providing the U.S. Congress and concerned citizens with a proposal for reforming the WNF system (see Recommendations below), by giving agency managers an incentive to reduce public costs and increase the value of the resources under their management, thus providing numerous benefits to the public that only standing forests can provide.

In our view, this analysis is not an endpoint, but rather a beginning. We offer this analysis as a framework based on simple, but powerful, principles of economic reasoning, and we illustrate how this framework can be put to use in evaluating the management of this nation’s forests. It is our hope that others use this framework and expand on any aspects that we could not fully develop. We hope that this report will alter the debate over the management of national forests by putting a strong focus on identifying the highest values and benefits that forests can provide to society and by exposing what is sacrificed when forests are not managed for these highest values.

2. Summary of Findings

1. The main question we tried to answer in this White Paper is whether the programs and activities envisioned in the 2006 WNF Plan are likely to maximize net benefits to the public from the WNF, which covers 238,000 acres in southeast Ohio. This involves looking at both monetary and non-monetary costs and benefits associated with implementing the plan over ten years.

2. We started our analysis of public benefits generated by implementation of the 2006 WNF Plan by identifying four threats to national forests that are pointed out in the two latest USDA Forest Service Strategic Plans. The Strategic Plans set national priorities and give guidance for planning on individual national forests. We assumed that major public benefits (or reduction of public costs) would result from addressing these four threats on the WNF.

3. We also identified five forest ecosystem services as having the potential to create high-value public benefits: Providing air purification, water supply and purification, carbon storage and sequestration, recreation, and safeguarding biodiversity.

4. We then evaluated the information provided in WNF Planning documents, including the Final Environmental Impact Statement (FEIS), the Land Resources and Management Plan (LRMP), and the Record of Decision (ROD), to determine how well the WNF Plan addresses the four major threats identified in the latest USDA Strategic Plans, whether the Plan improves the capacity of the WNF to provide ecosystem services, and what the costs are associated with achieving those benefits.

5. The first threat identified in the two latest USDA Strategic Plans is the risk of loss from catastrophic wildland fire caused by hazardous fuel buildup. The USDA Strategic Plan recommends consideration of risks, acknowledging that the severity of the damage from fire, and therefore the need for fuel reduction programs, can differ from one location to another. We found that the 2006 Forest Plan fails to establish the risk of forest fires on the Wayne and does not give any indication of the value of potentially protected structures or assets. Consulting other sources, it became clear that risks and potential damage from forest fires are low on the WNF and that ignition of structures during forest fires is most effectively prevented by home-site protection within a small radius of the home. Yet, over the next 10 years, the Forest Service is planning prescribed burns on 21,904 acres and 10,181 acres of mechanical treatments to address a minimal wildland fire risk that can be dealt with more effectively through other measures. Adding to this the environmental impacts resulting from large scale burn programs, we came to the conclusion that the WNF hazardous fuel reduction program creates a net public loss.

6. The second threat identified by the USDA Strategic Plans is the introduction and spread of non-native invasive species (NNIS), which degrade habitat for many endangered species and diminish biodiversity. The WNF FEIS elaborates on how logging, burning, mining, road and trail building, off highway vehicle (OHV) use and other recreational activities create conditions favorable to NNIS on 117,721 acres of the Forest. At the same time the FEIS states that an estimated 94,000 acres of WNF land are already infested with NNIS. This contrasts with projected NNIS treatments on only 1,900 acres of the

forest over ten years. Therefore it seems reasonable to conclude that the WNF Plan creates more NNIS problems than it can expect to solve—even considering the use of precautionary measures designed to slow down the introduction and spread of NNIS from logging, burning, mining, etc. Therefore, no net public benefits can be expected from the WNF Plan regarding NNIS.

7. The third threat identified in the USDA Strategic Plans is the fragmentation of forests. While the WNF FEIS acknowledges the need for large, continuous blocks of interior forest for some species of birds, it doesn't embrace the unique role that national forests have in safeguarding and expanding this habitat not just for a few birds, but for many other species that currently cannot even be found on the WNF. The FEIS does not provide any concise and comprehensive information on the current status of interior forest fragmentation on the WNF and provides only scattered and incomplete information on how fragmentation will develop as a result of the 2006 WNF Plan. However, the information that could be gleaned from the FEIS and the LRMP shows that there will be increased fragmentation of larger blocks of interior forest on at least 63 percent of the forest. This is mainly as the result of logging, road and trail building, and mining. We came to the conclusion that the WNF Plan does not provide the public with the net public benefit that would result from increased availability of large, continuous interior blocks of forest. However, the Plan does provide for increased availability of some continuous early successional habitat.

8. The fourth threat identified by the two latest USDA Strategic Plans is unmanaged recreation, particularly the unmanaged use of off highway vehicles (OHV). The WNF FEIS acknowledges the existence of illegal trails on the WNF, and states that there are a number of factors contributing to illegal OHV activity, including too few law enforcement officers, lack of signage for official trails, lack of a program to educate trail riders about OHV policies, and no established trail patrol program. But neither the current extent of illegal trails nor the actions planned to remedy the problem are clearly outlined in the WNF Plan. The Plan talks about possibly integrating some of the illegal trails into the official trail system, thereby expanding it, claiming that some of the illegal activity may result from not having available a sufficient number of official trails. Based on that same line of reasoning – that illegal OHV activity can be curbed by developing a system of official OHV trails – the 1988 WNF Plan opened up the WNF for official OHV use. The 2006 FEIS does not offer any evaluation of whether this approach was successful in reducing illegal activity, or whether illegal activity then actually expanded. The WNF Plan doesn't provide enough information to determine whether it may achieve the public benefits of curbing illegal OHV activity, and at what costs (including the costs of closing and rehabilitating illegal trails, or integrating them into the official trail system). Whether the Forest Service will be able to curb illegal OHV usage on the WNF and create a public net benefit for society is therefore an open question.

9. To assess the value of the ecosystem services provided to the public by forests such as the WNF, economists have developed various techniques that allow them to put a dollar value on services that are not traded in markets. There is now a big body of peer-reviewed and non peer-reviewed literature that covers many ecosystem services provided by temperate forests. By using a widely accepted method, the value-transfer approach, we were able to provide a rough estimate of the total value of ecosystem services provided by the WNF, which amounts to an average of \$381 million per year from ten different ecosystem services. The highest value comes from

providing habitat that is not available or extremely rare on private lands, followed by purification of the air, stormwater control, carbon sequestration, and soil retention. The per acre/per year values we used are from “The Economic Value of New Jersey State Parks and Forests.”¹ Another study, “Valuing New Jersey’s Natural Capital: An Assessment of the Economic Value of the State’s Natural Resources”² provided an insight into different components that make up the total ecosystem value of a forest. This study distinguished between the value of forest land, forested riparian areas, and forested wetlands. It showed that the value of wetlands is almost ten times, and the value of forested riparian buffers more than two times the value of other forest land. Ecosystem goods, on the other hand, such as timber, have dramatically lower values per acre per year than ecosystem services. They were valued at \$250 or lower per acre per year, whereas all ecosystem services combined were valued at an average of about \$1,800 per acre per year.

10. In analyzing how the WNF Plan impacts the capacity of the forest to provide air purification services, we found that Southeast Ohio has one of the highest air pollution levels in the nation and that four WNF counties are in non-attainment with regard to particulate matter. This indicates serious consequences for the health of county residents. Rather than vigorously expanding the capacity of the forest to provide air purification services, the WNF Plan adds pollution to the air and diminishes the forest’s capacity for air purification. Air pollutants are mostly added by prescribed burns on 68,119 acres over the next ten years (justified with hazardous fuel reduction and oak hickory restoration) and by OHV use. In EPA’s Region 5, which includes Ohio, nine percent of particulate matter (PM) pollution is estimated to come from OHV (compared to five percent from highway vehicles). In addition, 19 percent of volatile organic compounds (VOC) and 19 percent of nitrogen oxide (NOx) also come from OHV. On top of adding more pollution to the already heavily polluted air, the WNF calls for logging on 18,441 acres, taking out older trees which have much higher capacity to purify the air than younger trees. Trees will also be removed to accommodate roads, trails and mining operations (on 2,230 acres). We cannot tell whether, on balance, a public net loss or a public net benefit is generated by the Plan regarding air purification services, since it was beyond our ability to estimate the additional value generated by the trees that are left standing and growing. However, it is clear that the 2006 Forest Plan does not maximize net public benefit with regard to air purification services over the next ten years and will limit the provision of this service over decades to come, since 161,752 acres of the WNF have been declared suitable for timber

¹ Mates, William J., M.S. and Jorge L. Reyes, M.F., *The Economic Value of New Jersey State Parks and Forests*, New Jersey Department of Environmental Protection Division of Science, Research & Technology, Issued June 2004, Revised version issued November 2006. <http://www.nj.gov/dep/dsr/economics/parks-report.pdf>

² State of New Jersey, Department of Environmental Protection, *Valuing New Jersey’s Natural Capital: An Assessment of the Economic Value of the State’s Natural Resources*. <http://www.state.nj.us/dep/dsr/naturalcap/>

production. This means logging will eventually limit tree growth and delivery of air purification services on almost 70 percent of the forest in the long run.

11. With regard to water supply and filtration services, we again found that the 2006 WNF Plan both contributes to existing high levels of pollution and diminishes the capacity of the forest to purify water. Additional pollution can be expected from logging (on about 18,441 acres), mining, trails, roads, and recreational facilities (on 2,230 acres), burning (on 68,119 acres), other ground-disturbing activities (for example from utility lines), from legal and illegal use of OHV, and other high-impact forms of recreation. In addition, the capacity of the forest to provide much-needed water purification services is diminished by logging and prescribed burns, which can happen even in the riparian areas that most contribute to water purification. However, there are also positives, since the Forest Service is planning some mine reclamation and soil stabilization projects that will make a positive contribution to water quality. We cannot tell whether on balance, a public net loss or a public net benefit is generated by the Plan regarding water services, especially since it was beyond our ability to estimate the additional value generated by forest that is left standing and growing. However, it is clear that the 2006 Forest Plan does not maximize net public benefit with regard to water supply and purification services, and that the delivery of these services will be limited in the long run by declaring almost 70 percent of the forest suitable for timber production.

12. Global Climate Change is one of the most serious environmental, social, and economic threats the world is facing today. The warming of the atmosphere is linked to increased concentrations of so-called greenhouse gases, including increases in carbon dioxide from changes in land management. Even though forests in the U.S. have acted as net carbon sinks since the 1950s, the annual additions to the sink (sequestration) appear to be declining. The Environmental Protection Agency lists the following forestry practices that can sequester carbon or preserve carbon storage: Afforestation, reforestation, avoided logging, and longer harvest-regeneration cycles. Obviously, planned logging and burning and taking out vegetation for other reasons do not increase the capacity of the WNF as a carbon sink. There may be benefits from reforesting mine land and newly acquired forest land. The WNF Plan neither addresses the WNF potential for carbon storage and sequestration (and their potential economic value) nor analyzes potential impacts from Global Warming on the Forest. We cannot tell whether on balance, a public net loss or a public net benefit is generated by the Plan regarding carbon sequestration and storage. It was beyond our ability to estimate the additional value generated by forest that is left standing and growing. However, it is clear that the 2006 Forest Plan does not maximize net public benefit with regard to storing and sequestering carbon, and that the delivery of these services will be limited in the long run by declaring almost 70 percent of the forest suitable for timber production.

13. Just because the WNF Plan does not maximize net public benefit regarding specific ecosystem services, does not necessarily imply that the Plan as a whole with all of its different aspects creates a net public loss, or fails to maximize overall net public benefits. However, to

offset a net loss in one area, there has to be a net benefit somewhere else that is big enough to offset the loss (or a reduced benefit). The Forest Service justifies prescribed burns and timber operations, the biggest contributors to ecosystem service losses, as management tools to reduce hazardous fuel loads, to maintain oak hickory forest cover, and to create more early successional habitat. These are supposedly tools to enhance biodiversity in the forest. An important part of the study, therefore, was to establish whether the benefits provided from reducing hazardous fuel loads, from maintaining oak hickory forest cover, and from creating more early successional habitat are sufficient to offset the losses created by the Plan with regard to ecosystem services. We have already analyzed prescribed burns as a tool to reduce fuel loads on the forest and have come to the conclusion that this program produces a net public loss itself. Therefore, it cannot be used as a justification to offset net losses and the failure to maximize net public benefit regarding ecosystem services related to air, water, and climate. The Forest Service can rightly claim that its management for oak hickory and early successional habitat will benefit some species by providing for their habitat needs. The crucial question with regard to net public benefit, however, is not whether there are some benefits, but whether the benefits outweigh the costs, and whether net benefit is maximized. Given limited resources, including a limited amount of land, efforts to maintain or improve habitat for biodiversity have to be economically and ecologically wise, and focus on habitat and species that are most rare. The Forest Service is not making a convincing case in its planning documents that maintaining oak hickory forests is connected to any public need, and why this forest type, that can only be maintained through ongoing logging and burning, should be preferred to allowing natural processes to re-establish themselves. Large, continuous blocks of interior old growth forest are the scarcest type of forest habitat, yet the Forest Service chooses to increase, rather than decrease the fragmentation of that habitat, to provide greatly increased opportunities for the spread of NNIS, which are one of the major threats to native biodiversity, and to provide more early successional habitat which, comparatively, is in plentiful supply on private forest lands in the Eastern United States. With regard to some species, especially the endangered Indiana bat, and several other federally listed species, the Forest Service claims that they will benefit from the 2006 WNF Plan, and that the admitted short term negative effects on these species will be offset by long-term benefits from improving their habitat. But this statement is belied by the fact that the habitat modification program envisioned by the Forest Service will have to go on as long as the Forest Service upholds the maintenance of oak hickory cover and of unnaturally large areas of early successional habitat as a desirable goal. That this is indeed a long-term goal, can be concluded from the fact that nearly 70 percent of the WNF have been declared suitable for timber production, which means that “short-term” impacts on these species will be generated over decades in different parts of the forest, as the Forest Service accommodates commercial timber extraction. We have come to the conclusion that the Forest Service does not establish a public net benefit with regard to enhancing biodiversity. Therefore, contrary to the claims of the Forest Service, there is no net benefit from logging and burning that could offset losses with regard to other ecosystem services.

14. Recreation is considered as an ecosystem service provided by forests. Mining, logging, and burning create conflicts with the use of the forest for recreation. Conflicts can come from noise

pollution, smoke, and visual degradation. In addition, different forms of recreation can conflict with each other. For example, OHV usage may disrupt other, less intrusive forms of recreation, like hiking and wildlife viewing. But all forms of recreation may have more or less severe environmental impacts. Which forms of recreation will provide the highest net benefit to society? They are the ones that attract the most users and create the highest consumer surplus, while having low impact on the environment and other uses of the forest and while being inexpensive to provide. On the WNF, nature viewing, hiking sightseeing, and picnicking are the most popular outdoor recreation activities. This is in line with what is most in demand in the region and the rest of the nation. These activities have comparatively low costs and low environmental impact. Yet it seems that OHVs, that have high environmental impact, probably create the most conflicts with other users, and are associated with high costs for trail construction, maintenance, monitoring and enforcement, receive the most attention in the WNF Plan in terms of additional, very expensive trails over the next ten years. While some additional hiking trails are also proposed in the Plan, there is no strong focus on developing low impact, nature based recreation activities. We therefore conclude that the Plan is not creating a net public benefit with regard to recreation.

15. Why is the Forest Service so keen on maintaining oak hickory forests and creating early successional habitat on the WNF? Why is the Forest Service allowing mining and highly destructive forms of recreation, given all the negative impacts these activities have? And why, on top of all that, does the Forest Service actually pay millions of dollars of taxpayer money to subsidize private logging, mining, and OHV use on WNF land, as we showed with budget data obtained through a Freedom of Information Act request? Why does the Forest Service not just decide to let the forest grow into an old growth forest, which requires minimal “management,” and will provide highly valued ecosystem services completely free of charge? These are questions begging for an answer not just for the WNF but also for other national forests across the nation.

The answer lies in incentives established by Congress and in funding provided by congressional appropriations that support logging, burning, and highly destructive forms of recreation. In the last analysis, it is Congress that determines what activities can happen on the WNF and whether money is spent to increase or diminish net public benefits provided to the public from forest management.

16. The Forest Service, however, does play a part in convincing Congress to continue funding extractive and destructive programs that secure jobs and income for Forest Service employees, and that benefit certain industries. The WNF planning documents (FEIS, LRMP, ROD) submitted to the public by the Forest Service do not provide a systematic, rigorous analysis for important public benefits and costs. Information is often scattered, unfocused, incomplete, or non-existing, especially with regard to ecosystem services. For example, on the important issue of fragmentation, little bits of information are provided here and there that indicate increased fragmentation in some management areas from implementation of the plan, but there is no attempt to systematically and comprehensively analyze the current state of interior forest

fragmentation and the impacts of the plan for the forest as a whole. This indicates that fragmentation was either not high on the priority list, even though it should be according to the USDA Forest Strategic Plan, or that the Forest Service preferred not to look at this issue too closely. It was clear that interior forest fragmentation would increase from logging and burning and that exposing this would create opposition to the plan. With regard to carbon sequestration and storage, there is no information at all in the plan, and generally, the high value of ecosystem services to society is a non-issue. On the other hand, a few issues that are important for assessing net public benefits are analyzed at great depth, as is the issue of NNIS. The FEIS exposes how the 2006 plan will greatly increase opportunities for NNIS to spread around the WNF, but that does not lead to the conclusion that it may be better not to take this risk. The planning documents are completely lacking even the most basic budget estimates for what it will cost to implement different programs, and how they will be—or need to be—supported by appropriations, fees, or special funds.

17. Our analysis also addressed macroeconomic aspects of the 2006 Forest Plan, which include issues of employment, income, and economic growth in WNF counties. Obviously, some of the local income and employment comes from logging, burning, and mining. These are the very activities that are likely to generate higher public costs than benefits. Could it be argued that those activities should nevertheless be pursued in the future, because they support local income and employment? What role do mining, logging, and recreation play in the economies of the WNF counties? Our analysis of macroeconomic data for WNF counties shows that income from logging is mostly below one percent of income generated by all work places in these counties. Income from mining is higher in some of the counties, but cannot be considered a significant contributor to the local economy. Government and health services are much more important.

18. In WNF counties, unemployment and poverty rates are higher and income levels lower than state averages. It is therefore understandable that jobs related to logging, mining, and burning may be considered important for the local economy.

19. However, as we showed in this study, continuing a focus on mining and logging could backfire by stifling recreation-related industries, since resource extraction diminishes the attractiveness of an area for recreation. Burning tens of thousands of acres of forest land likewise has negative impacts on recreation, and also may create an economic burden on WNF communities by making it harder for them to get back into attainment for particulate matter. Business expansion and attraction of new businesses may be limited until the counties are in attainment.

20. By focusing on forest restoration instead of extraction, and by expanding forest habitat that is rare or nonexistent on private lands, WNF counties could benefit economically in a number of ways. They could develop more of the economic potential from nature-based tourism like sightseeing, hiking, and wildlife watching. These activities are in high demand across the nation. A national forest that is healing from the wounds inflicted on it by logging, mining and

destructive forms of recreation, would make it more likely that new, cleaner industries and their employees are willing to move into the area, expanding income and employment opportunities.

21. The Forest Service continues to allow mining and logging on national forests not because local economies depend on it, but because Congress is willing to provide the appropriations for it. Congress could just as well provide appropriations for activities that yield a net public benefit and still create jobs for both the Forest Service and WNF counties.

3. Recommendations

These recommendations are based on the findings of this report, and are derived from basic principles of economic reasoning, which demand the maximization of net public benefit.

Simply put, net public benefit is maximized by preferring activities that generate a high net public benefit (= benefits minus costs) over those that create a lower net benefit. Net public benefit for any activity increases when costs of achieving that benefit go down, and decreases when costs go up. For this analysis, costs and benefits have both monetary and non-monetary components.

Net public benefit cannot be maximized when activities that have a low net public benefit (or that generate a net public loss), are preferred over activities that have a high net public benefit (large benefit, low cost).

Basically, our recommendations consist of pointing out activities that are likely to generate the largest possible positive difference between costs and benefits.

1. The Forest Service activities that generate the highest (long and short-term) financial costs on the WNF—prescribed burns, logging, mining, and OHV use—are also the ones that generate the most pollution and that most diminish the capacity of the Forest to provide highly valued ecosystem services related to air, water, climate, recreation, and biodiversity. Therefore, by simply stopping to log, burn and mine, the Forest Service can at once cut short-term and long-term costs considerably (including future costs of mine reclamation, or costs of removing roadbeds that were constructed to facilitate logging), and provide much larger public benefits from ecosystem services.
2. Stopping logging, mining and prescribed burning will give the forest the opportunity to heal from centuries of heavy abuse. With trees being allowed to grow beyond the age when it is economical to log them, second growth forest will, over 200 to 300 years, develop into old growth forests, in which early successional habitat is provided by natural disturbances, and the forest develops a fine grained structure of habitats at various stages of succession. Old growth forests have all but disappeared from the landscape, and facilitating its recovery will greatly enhance one of the most valuable of all ecosystem services, the provision of rare interior forest habitats that keep associated species from going extinct (currently valued at over \$900 per acre/per year).
3. To further enhance the potential of the WNF to provide highly valued ecosystem services, the Forest Service needs to put increased emphasis on mine reclamation, removal of roads and trails, on reclaiming and reforesting areas with highly compacted or eroded

soils, repairing damaged stream banks, and restoring wetlands. Forested wetlands and riparian areas have the highest ecosystem values of all forest land, and should therefore receive priority with regard to any necessary restoration work. (Ecosystem services from general forest land are currently valued at \$1,476 per acre/per year, from wetlands at \$11,568 per year, and riparian buffers at 3,383 per year).

4. We recommend that the Forest Service increase the recreational value of the forest by excluding OHVs from the WNF, by closing and rehabilitating all illegal trails, and by enacting an effective program for monitoring and enforcement of forest regulations related to OHV. The existing OHV network is too large to be effectively monitored and maintained at a reasonable cost. The negative effects of both legal and illegal OHV usage—air, water and noise pollution, damage to wildlife habitat and conflicts with other high value, low impact recreation activities—outweigh any perceived benefits from OHV use. Providing ORV trails should be a private landowner function and the federal government shouldn't compete on this.
5. Instead of expanding OHV trails, we recommend that the Forest Service focuses on facilitating more highly valued uses, such as hiking, wildlife viewing, visits to historic/cultural sites, use of highly developed recreational sites, and swimming. This can be accomplished for example by offering more hiking trails that are not open to conflicting uses by horses or mountain bikes, and more opportunities for wildlife watching. We support the Forest Service identifying, protecting and developing recreational opportunities related to cultural and historic sites, which have already been identified by the Forest Service as a niche for the WNF.
6. We also support the Forest Service in consolidating forestland within the WNF proclamation area through purchases of land from willing sellers, and recommend that priority is given to high-value riparian areas, areas with wetlands, areas suitable for wetland restoration, and areas that could help expand and restore large, continuous blocks of interior forest.
7. In addition, we recommend that the Forest Service addresses ownership fragmentation through buying conservation easements from private land owners.
8. To increase the prospects of expanding habitat for rare and endangered forest species we recommend that the Forest Service partners with other public and private land owners to create wildlife corridors that connect small remnants of still existing original forest with each other and with the emerging old growth forest.
9. We recommend that as a rule, prescribed burns for treatment of hazardous fuels on the WNF not be used, since they are ineffective in protecting home sites, and the risk of wildland fires is low on the WNF. If and when abnormal, significantly higher fire risks

do develop on the Wayne, appropriate risk reduction activities should be considered on a case by case basis.

10. We recommend that any future Forest Plans provide a rigorous, focused, and complete analysis of monetary and non-monetary costs and benefits associated with different activities (including detailed budget projections), inspired by the format developed in this report.
11. Future Forest Plans should include reports on the values of different ecosystem services, and how they are affected by management activities. The values of different ecosystem services (per acre/per year) can be expected to change over time. Forest plans should keep up with new developments in ecosystem valuation. At some time, it may be appropriate for the Forest Service to conduct original studies on specific ecosystem services that may be of special importance for the WNF.
12. Instead of conducting benchmark analyses showing the largest possible timber output or OHV trail length, the Forest Service should develop benchmarks related to the highest benefits derived from the forest, for example the number and size of unfragmented interior forest blocks, the consolidation of forest land, the development of high value/low impact recreation opportunities, the reintroduction of charismatic species, the restoration and rehabilitation of disturbed lands (including wetlands and riparian areas), the rehabilitation of illegal OHV trails, and the effective enforcement of regulations on existing trails.
13. There will be jobs and income for the Forest Service and local communities from the implementation of these recommendations, but they will be different jobs with new job descriptions. For example, the Forest Service would not need experts in timber management any more, but instead would need to hire or contract with professionals trained in different aspects of ecosystem restoration, and re-introduction of rare species. People would be hired or contracted for monitoring trails and enforcing regulations. Experts in identifying, protecting and developing historic/cultural sites would be needed, and jobs and income opportunities would develop around expanding opportunities for high value/low impact recreation.
14. Currently, off-budget funds such as K-V and Salvage Sale Fund, and the Fee Demo Project, create incentives for Forest Service managers to continue logging, mining and offering high-impact recreation such as OHV use. We recommend that Congress remove such incentives. Instead, new incentives should be created for managers to give priority to forest restoration, endangered species protection, and to increasing the capacity of the forests to provide highly valued ecosystem services, including different forms of low impact recreation.

15. We recommend that the Forest Service put together a task force that includes low impact recreation groups, wilderness advocate groups, and other interested parties to do a serious survey of areas on the WNF that might be designated Wilderness.