

Professional Review & Comment
on
Draft Environmental Impact Statement for
Constitution Pipeline Project (February 2014),
FERC Docket No. CP13-499-000

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EXECUTIVE SUMMARY

This review of the Draft Environmental Impact Statement (Draft EIS) for the proposed Constitution Pipeline project along with the environmental submittals and documentation provided to the Federal Energy Regulatory Commission (FERC) by the Constitution Pipeline Company, LLC (Constitution) was prepared in response to a request by Earthjustice to provide expert opinion on issues of terrestrial and restoration ecology. The construction and maintenance of the proposed 124-mile linear infrastructure will have significant, long term impacts upon the ecological systems both within, and adjacent to, the proposed right-of-way. Avoidance, minimization, or mitigation of land disturbance impacts, such as those associated with the conversion of forested systems to non-forest systems, is critical to ecological sustainability.

Materials reviewed include:

- 1) FERC's Draft Environmental Impact Statement for the Constitution Pipeline and Wright Interconnect Projects, February 2014
- 2) Constitution's Environmental Construction Plan, Construction Activities in New York, November 2013 (Environmental Report, Vol. II, Appx. J)
- 3) Constitution's New York Invasive Species Management Plan, November 2013 (Environmental Report, Vol. II, Appx. J, Attachment 11)
- 4) Constitution's Soil Erosion & Sediment Control Narrative & Environmental Construction Plan, Construction Activities in Pennsylvania, November 2013 (Environmental Report, Vol. II, Appx. I)

5) Constitution's Pennsylvania Invasive Species Management Plan, November 2013
(Environmental Report, Vol. II, Appx. I, Attachment 11)

These materials identify many of the well-documented negative ecological consequences of forest fragmentation, edge habitat creation, and invasive species proliferation, but the mitigation measures proposed fail to fully account for, and address, the impacts that the construction and maintenance of this infrastructure will have with respect to these ecological disruptions.

In particular, the mitigation measures proposed fail to:

- Properly account for the geographic extent and temporal frame of forest edge impacts;
- Fully quantify and mitigate against the loss of interior forest habitat and associated structural and functional values ;
- Recognize the landscape-level dynamics and mitigate against the ecological cascades associated with invasive species and biological invasion;
- Address forest restoration in the significant areas to be deforested as a result of temporary workspace creation;
- Account for the full cumulative impacts associated with the development of this linear corridor.

The landscape-level changes associated with the construction of this corridor are likely to result in an undesirable diminution of the ecosystem benefits and services currently

provided by the biotic communities along this route. Cascading ecological effects are probable and will require costly management interventions of significant spatial and temporal scale in order to achieve system restoration.

Given the failure of the FERC Draft EIS to properly analyze and address the full cumulative impacts of the proposed pipeline, in particular with respect to forest resources and subsequent watershed integrity, a revised draft should be developed and resubmitted for public comment. Should the proposed pipeline project proceed as currently described in the Draft EIS, significant long term negative changes in ecological integrity along the right-of-way corridor are probable.

DISCUSSION

A careful review and analysis of the Draft EIS and the materials submitted by Constitution reveals a number of areas of concern with respect to the maintenance of the ecological integrity of terrestrial ecosystems and the corresponding impacts upon aquatic resources. In particular, these plans do not adequately provide for the protection and sustainable regeneration of forest systems along the proposed pipeline route. The canopy cover provided by the forested lands through which the proposed pipeline would cut is of extreme importance to both the quality and quantity of water that flows within the regional drainages.

Background

Forests filter contaminants, moderate stream temperatures and buffer flow volumes associated with precipitation events. They are the structural foundation upon which the ecological integrity and health of this region's biological resources are built. The link between percent forest cover and water quality is clearly established in the scientific literature. As an example, reductions in forest cover are directly correlated with negative changes in water chemistry, such as increases in nitrogen, phosphorus, sodium, chlorides, and sulfates, and with reductions in stream macroinvertebrate diversity (Jackson and Sweeny 2010).

Forest fragmentation as a result of anthropogenic landscape modification is well recognized within biogeographic theory and conservation biology as a leading cause of local species extinctions (extirpation). It can also cause dramatic shifts in the floral and faunal composition of woodland communities. Sub-lethal impacts to floral and faunal populations (population isolation, reduced genetic fitness and diversity) have also been associated with disruptions to forest connectivity (Clark, et al. 2010). Recent modeling work performed by the Pennsylvania Chapter of The Nature Conservancy indicates that approximately two thirds of the Marcellus well pads to be built in Pennsylvania will be located in what is currently forested habitat (TNC 2010). The USGS has also documented a disproportionate level of interior forest loss (two to three times greater than overall forest loss) over the last several years from natural gas infrastructure construction in areas such as Susquehanna County, PA (Slonecker 2013). Pipeline collection and transmission corridors have proven to be the primary contributing factor in the loss of interior forest.

Fragmentation creates an increase in the amount of forest edge (the interface between forest and non-forest). This transitional zone or “ecotone” is fundamentally different in structure and functionality from an interior forest system. Edge habitat is characterized by increased light levels on the forest floor, reduced soil moisture, and a high degree of biological invasion from non-native invasive organisms. Dramatic changes can occur in the soil chemistry and associated micro biota. The top layer of the soil profile, the rich organic duff, begins to dry out and the primary decomposition community begins to shift from fungal to bacterial. Typically extending up to 300 feet into the forest, edge impacts are more than mere esoteric considerations of interest to the scientific community; these changes have direct economic implications to both landowners and society. Invasive species, for instance, have been estimated to cost the U.S. economy approximately \$120 billion dollars per year (Pimintel et al. 2004).

Invasive organisms within terrestrial forest environments tend to be early successional species that respond favorably to site disturbance. Disruption of native plant cover and the exposure of the forest floor to sunlight provide an opportunity for these organisms to establish satellite populations. These populations eventually radiate out into the adjacent forest, displacing native species and retarding desirable tree regeneration (Bennet et al. 2011). Dispersal (vectoring) mechanisms and/or corridors are required in order for these non-native species to colonize new locations and the access roads, pipelines, and vehicular traffic associated with natural gas extraction is ideally configured to serve this function. Far beyond the point where wells are decommissioned, the landscape legacy of forest edge from pipeline corridors, access roads and well pads will continue to disrupt ecosystem

functioning as non-native organisms repeatedly colonize exposed areas and impede desirable tree regeneration.

Invasive species suppression and the eventual restoration of these disturbed sites to forested systems will require resources of a significant financial and temporal scale. While published information is scarce, it is in the professional experience of restoration practitioners in this region that the reasonable reconstruction of forest canopy and understory diversity can cost between \$4,000 and \$10,000 per acre. The suppression of invasive plant species is also a major, recurring expense with the initial years' treatment often costing between \$1,000 and \$2,500 per acre. Invasive treatment in subsequent years typically drops in cost by approximately 50% per year over the first three years.

As the effects of forest fragmentation may not immediately manifest themselves following the disturbance, monitoring is often suggested as a methodology to balance and modify the level of fragmenting activity in accordance with the conservation of forest-related ecosystem services. Unfortunately, these effects may not be linear in nature and thus are not always amendable to an adaptive management approach. Biological systems may possess thresholds that provide little indication of impending adverse impacts until sudden system collapse.

It is from within this conceptual framework that a review of the Constitution Pipeline submissions was undertaken and the following concerns identified.

Shortcomings in the Draft EIS

VEGETATION

- **Section 4.5.1 – Existing Vegetation Conditions**

FERC correctly identifies that the majority vegetation cover type to be impacted by the pipeline project and associate workspaces will be upland forest. However, it grossly underestimates the area of impact as it arbitrarily assumes the “impact” to be restricted to the area where soil is moved or vegetation cleared (983 acres). This completely disregards the science of conservation biology with respect to forest fragmentation and edge impacts. At a minimum, where infrastructure traverses or disrupts forest cover, the impact area should include a zone extending 300 feet into the adjacent forest. FERC already recognizes this impact zone in its definition of interior forest (Draft EIS at 4-70). It is logically inconsistent to fail to include this area when calculating areas of impact.

In order to properly determine the area of forest impact, FERC must conduct a spatial analysis whereby the vegetative cover zones along each segment of the proposed pipeline route would be examined and the size of the forest polygons that the route crosses calculated—not just the area of forest cleared during construction.

- **Section 4.5.2 – Vegetation Communities of Special Concern or Value**

FERC makes the claim that a 9% reduction in the width of the construction right-of-way within two areas containing NYSDEC significant natural communities (a Limestone Wooded Community and a Calcareous Talus Slope Woodland – both in Schoharie County, NY) will “...*minimize impacts on these areas to the extent practicable.*” As the construction right-of-way will still be 100 feet across, there is a reasonable probability from an ecological standpoint that the increased light penetration and soil moisture changes associated with this newly created forest edge will result in changes to the vegetative community. FERC has offered no scientific justification for concluding that the 9% reduction will have any substantive positive impact.

- **Section 4.5.3 – Interior Forest Habitat**

FERC correctly adopts the definition of interior forests as “...*forested areas greater than 300 feet from the influence of forest edges or open habitat.*” This indicates that FERC does indeed recognize and acknowledge the science behind edge impacts and their effect on forest systems. Yet FERC, within the Draft EIS, repeatedly grossly underestimates the acreage of forest disturbance by refusing to account for the adjacent edge-impacted forest areas. For example, FERC repeats Constitution’s claim that the Project only will permanently eliminate 217.9 acres of interior forest.

FERC repeats Constitution's misleading estimate of interior forest disturbance: "*Constitution would bisect 129 interior forest blocks greater than 35 acres, creating 55 forested blocks less than 35 acres in size.*" This information is of little value in understanding the level of interior forest loss that will occur should the project be built. The number of interior forest blocks is not the issue, the total acreage of interior forest lost both to clearing and the 300-foot penetration of edge effects is the metric of concern. FERC should require the complete disclosure of, and a comparative analysis demonstrating, the total acreage change in interior forest habitat that is being proposed. This analysis should include full spatial data detailing the extent of interior forest resources along the entire proposed pipeline route, along with connecting forest and riparian corridors. Once the full scope of impacts to interior forests is determined, FERC should also require the preparation of a complete analysis of the disruption in forest connectivity and landscape-level wildlife corridors that will occur and of any avoidance, minimization, or mitigation measures available.

In addition, FERC has based its analysis of interior forest value solely upon avian species and has neglected to discuss the documented changes in vegetation and soil dynamics associated with forest edge creation. Loss of interior forest will impact populations of terrestrial organisms such as certain amphibians which can be effectively isolated, and cut off from, historic breeding locations by linear infrastructure.

- **Section 4.5.4 – Noxious Weeds and Other Invasive Plant Species**

FERC erroneously states that Constitution will be “...*discharging hydrostatic test waters within the source watershed*”. What Constitution actually states is, “*Once the testing is completed, the hydrostatic test water will be returned to the same watershed(s) from which they were collected, where possible*”.

(Constitution’s New York Invasive Species Management Plan, section 3.3.1).

The use of untreated surface water in massive quantities for hydrostatic testing (16,592,520 gallons estimated for the New York section of the pipeline) creates a large risk of vectoring invasive species. It is unrealistic that these volumes of water could be discharged onto the ground and, given the topography of the region, not have overland transport into drainage pathways. The unintentional introduction of an invasive organism (such as *Didymosphenia geminata* or “rock snot”) from one subwatershed into another could have devastating long term economic and ecological consequences. As an example, non-indigenous species that have been introduced to the New York State Canal and Hudson River system have caused estimated annual losses of \$500, the majority of which involved harm to commercial and sport fishing industries.

FERC also is not accounting for latent seed back germination or for the long term vectoring of invasive species that will occur throughout the service life of the right-of-way due to forest fragmentation and edge creation. As such,

the conclusion that “...the potential spread of noxious or invasive weeds would be effectively minimized or mitigated” is unsupportable.

WILDLIFE AND AQUATIC RESOURCES

- **Section 4.6.1.3 – Migratory Birds**

FERC correctly recognizes that the fragmentation of large forested tracts during construction and operation of the project could create long-term impacts on Birds of Conservation Concern, yet the only specific recommendation offered to reduce these chronic impacts to interior forest bird species is a minor reduction of the right-of-way width, where possible, by 9%. As stated previously, there is no scientific justification to demonstrate that this will have any significant, measurable impact on reducing the level of habitat loss.

The loss of interior forest habitat will permanently remove suitable breeding habitat from these species as there is no forest restoration plan included in the FERC analysis. Additional disruption of nesting success from brown-headed cowbird parasitism is likely due to the proliferation of forest edge and the corresponding diminution of interior forest. Without a cumulative analysis of the total interior forest acreage lost, the Draft EIS cannot properly assess the impact to migratory wildlife.

- **Section 4.6.1.3 – Migratory Birds**

Misleading statements are made with respect to the value of early successional habitat. For example, *“the creation of additional edge habitat could benefit certain species by providing travel corridors and additional forage habitat”*. This conveniently ignores the declining levels of interior forest habitat and the corresponding explosion of edge conditions across the eastern United States. Edge is ubiquitous and can be created overnight. Interior forest requires decades of accrued equity in tree growth. To equate the two is highly simplistic and misleading. Missing is a discussion of the threat that these corridors pose with respect to vectoring corridors for biological invasion and the ubiquitous nature of edge habitat across the eastern United States.

- **Section 4.6.1.5 – Conclusion (Wildlife and Aquatic Resources)**

FERC states that *“Overall, wildlife resources are not expected to be significantly impacted due to construction and operation of the projects based on the amount of similar adjacent habitat available for use, the proposed clearing window for avoidance of the migratory bird nesting season, and our recommendation to develop an Upland Forest Mitigation Plan, which would further minimize impacts on wildlife due to forest clearing.”* This statement is wholly unsupportable as FERC has not properly estimated the level of lost interior forest, nor has it addressed the chronic impacts associated with the creation of forest edge for the entire service life of the right-of-way. Neither

FERC nor Constitution has produced any spatial or population data to justify the contention that there is adequate adjacent habitat to support specific wildlife species likely to be impacted by the project. As the recommended Upland Forest Mitigation Plan has neither been written nor reviewed, it is also premature to utilize it as further justification for the conclusion that wildlife impacts will be minimized.

- **Section 4.7.3 – State Listed Species**

With respect to the small-footed bat, the northern myotis, and the silver-haired bat, FERC reaches the conclusion that the project would not result in adverse impacts on these sensitive species. However, FERC utilizes the Upland Forest Mitigation Plan recommendation, a plan that has neither been written nor reviewed yet, as part of the justification for this conclusion. This is premature.

FERC comes to a similar premature conclusion with respect to the Timber Rattlesnake, listed as threatened in New York. The Commission points to unwritten and unspecified “mitigation measures” as justification for a population level conclusion on the viability of a sensitive species.

- **Section 4.13 and 5.1.13 – Cumulative Impacts**

FERC reaches the unsubstantiated conclusion that the cumulative impacts associated with Marcellus Shale development and the proposed project

would not contribute in any significant way to adverse effects on water resources. To justify this conclusion, FERC defers to the regulations and associated Best Management Practices of both the Pennsylvania Department of Environmental Protection and the Susquehanna River Basin Commission. However, this presupposes that the regulations promulgated by these two agencies are, in themselves, adequate.

FERC fails to include any analysis of the landscape-level disruption to watershed hydrology that occurs when vegetative cover types are changed.

FERC also fails to present any spatial analysis of the cumulative impacts to interior forest resources associated with forest fragmentation and forest edge creation. Interior forest functioning is predicated upon the spatial orientation and configuration of each forest block in relation to adjacent forests and other land cover types. Disruption of connective corridors, edge effects penetration, and a reduction in edge complexity (straight, linear edge as opposed to sinuous, gradual edge) will have ecological consequences that cannot be understood with a quantification of these disruptions.

FERC has failed to provide any plan for the restoration of forest resources associated with this proposed project. While FERC recognizes that, "The greatest impact on vegetation would be on forested areas because of the time required for tree regrowth back to pre-construction condition," it ignores the

need to manage the reforestation effort and assumes natural regeneration will return the system to “pre-construction condition.” This statement is unjustified as FERC is assuming the forest trajectory will follow historic patterns of regeneration. As riparian tree cover will not be allowed within the majority of the permanent right-of-way (within 15 feet of either side of the pipeline in wetland environments), stream shading will be reduced permanently, not “temporarily,” as claimed in this section. Loss of tree cover can lead to elevated water temperatures, reduced dissolved oxygen levels and, ultimately, to reduced fish survival and fitness. Without a planting and/or restoration plan, and given the permanent linear edge created along the maintained right-of-way, reforestation of temporary workspace is likely to be delayed for decades as undesirable, early successional vegetation becomes established in the disturbed areas. Planning and management will be required to assure full restoration of the original forest structure and function.

With respect to fisheries, FERC’s analysis is limited to individual waterbody crossings and disturbances and fails to address the likely changes in subwatershed water quality and flow quantity associated with vegetative cover changes.

Environmental Construction Plan – Construction Activities in New York¹

While the Environmental Construction Plan for New York (“ECP-NY”) primarily focuses upon sedimentation and erosion control in relation to surface water quality, it fails to detail or account for changes in vegetative cover type that will disrupt both surface and subsurface hydrologic regimes. Conversion of cover type from forested to non-forested will impact both groundwater recharge and surface run-off coefficients within ecological planning units such as the subwatershed. Forested land has a greater capacity for the interception and retention of precipitation than either grassland or developed soils. A conversion and dispersed disruption of this cover type will result in reduced groundwater recharge, heavier plug flows in streams during storm events, and reduced base flows of streams during dry periods.

The ECP-NY misleadingly states that, “*The existing [rights-of-way] provide corridors that will be utilized by several species to move between habitats.*” However, the ECP-NY fails to identify the corresponding suite of interior species that are effectively blocked from movement across these same corridors. Edge habitat, along with the generalist species that are listed in this section as utilizing these right-of-way corridors, is ubiquitous across the eastern United States. The interior forest habitat disrupted by these corridors is a rapidly diminishing resource. In addition to providing habitat for a range of species intolerant of edge conditions, interior forests are structurally and functionally different from edge systems. It is important not to equate the two. For instance, soil moisture and organic matter levels are typically higher, and forest floor light levels lower, in interior forest. As a

¹ Due to the high degree of commonality between the ECP-NY and ECP-PA plans, the concerns detailed here are applicable to both documents.

result, the decomposition community is primarily driven by fungal organisms as opposed to bacterial. This has profound implications for both nutrient recycling and plant growth.

Interior forests are also critical to watershed integrity as they have higher rates of stormwater retention and filtration. In addition, these systems are important carbon sinks due to their long term stability. Interior forest represents decades of accrued equity in tree growth and cannot be reproduced without a significant time investment.

- **Section 5.3 – Clearing**

The ECP-NY indicates that trees to be saved will be marked before clearing begins. Unfortunately, no clear tree preservation strategies are provided. Violation of the integrity of the critical root zone (the area around each plant encompassing the majority of the fine, feeder roots) will result in eventual tree loss due to soil compaction. It is vital that, at a minimum, details be provided regarding the methodology for determining both the size of the critical root zone and the protective measures to be employed.

- **Section 5.3 – Clearing**

The Draft EIS does not provide any detail with respect to the removal of cleared-tree debris. In order to minimize negative impacts caused by tree clearing, the ECP-NY should prohibit the stockpiling or discharge of woodchips into adjacent woodlands or within the critical root zones of trees targeted for retention.

- **Section 5.5.7 – Restoration and Revegetation**

This section confuses “restoration”; a process that reproduces the original structural and functional attributes of the disturbed ecosystem, with “reclamation”; the minimization of erosion and sediment movement. None of the submitted plans addresses “restoration”.

In order to maximize the opportunities for maintaining ecological relationships, native species should be required as the dominant vegetative cover in plantings conducted outside of developed and agricultural landscapes.

Testing for, and mitigation of, soil compaction should not be limited to agricultural areas, particularly with respect to temporary work spaces that, pre-disturbance, contained forest cover. Soil compaction is a major inhibitor of desirable tree regeneration and establishment. Restoration of the forest system and the associated economic value along these temporary work spaces will require protection of soil structure.

No allowance has been made for the reforestation of denuded areas of forest within the proposed 50 to 60 feet of temporary workspace that is described in section 4.1.1 (Right-of-Way and Staging Areas). At a minimum, these areas will require either supplemental tree planting or an approved reforestation plan utilizing adjacent seed sources if true restoration is to occur.

- **Section 4.6.1.3 – Migratory Birds**

Misleading statements are made with respect to the value of early successional habitat. For example, *“the creation of additional edge habitat could benefit certain species by providing travel corridors and additional forage habitat”*. This conveniently ignores the declining levels of interior forest habitat and the corresponding explosion of edge conditions across the eastern United States. Edge is ubiquitous and can be created overnight. Interior forest requires decades of accrued equity in tree growth. To equate the two is highly simplistic and misleading. Missing is a discussion of the threat that these corridors pose with respect to vectoring corridors for biological invasion and the ubiquitous nature of edge habitat across the eastern United States.

Invasive Species Management Plans²

- **Section 1.0 – Introduction**

The Invasive Species Management Plan (ISMP) states that Constitution’s overall goal is to, *“...control the invasive species to the extent that wetlands and uplands are not dominated by the invasive species to the point where the functions and values of the systems/habitats are adversely compromised”*. However, there are no measurable metrics indicated in the document that would allow for quantitative assessment of progress towards that goal. It is common practice in invasive control contracts for the land management entity to require a certain

² Due to the high degree of commonality between both the New York and Pennsylvania Invasive Species Management Plans submitted by Constitution Pipeline Company LLC, the concerns and recommendations detailed here apply to both plans.

percentage of invasive cover reduction be achieved after a given time frame. This provides a clear benchmark whereby project success can be measured. Constitution's Plan lacks such a requirement.

While the plan identifies the difficulty in achieving eradication of invasive species due to issues such as seed drift and/or colonization from off-site locations, it fails to mention two critical vectoring mechanisms that are of extreme importance when dealing with a right-of-way construction: (1) the latent seed bank residing in the soil, and (2) the chronic encouragement of invasive colonization due to the expansion of edge habitat. Depending upon the species, invasive seeds and propagules can survive in the soil for years. Japanese stiltgrass (*Microstegium vimineum*), for instance, has a seed viability that exceeds seven years. Movement of soil from one section of the project to another can easily disperse these organisms across the entire location.

The nature of edge habitat – disturbed areas of high light penetration, creates ideal conditions for biological invasion. One of the primary transport mechanisms for invasive plants are birds that preferentially roost at the forest edge and subsequently defecate invasive seeds into the understory. It is important to recognize that, until such time that the forest canopy closes over the right-of-way, the edge habitat that has been created will be highly susceptible to invasive colonization. Once established, small populations can

expand into off-right-of-way properties and disrupt forest regeneration, soil chemistry, habitat, hydrology, and ultimately land value.

Recognizing the chronic nature of the biological invasion threat that is promoted by the creation and perpetuation of edge habitat, it is obvious that a treatment timeframe that only lasts for three years is wholly inadequate.

- **Section 2.0 Existing Conditions**

The ISMP incorrectly characterizes invasive plant species as “*nutrient-poor-soil-loving species*”. In actuality, invasive plant species are more likely to become established and outcompete native plants in soils that are nitrogen rich. Supplemental fertilization should be avoided in areas where invasive activity is occurring.

- **Section 3.1 – Measures to Prevent or Control the Transport of Invasive Plant Species**

The ISMP indicates that sediment and erosion control devices will be used to help prevent the dispersal of seeds and root masses from invasive plant species into “*...wetlands currently unaffected by invasive species*”. As upland systems are also susceptible to biological invasion this strategy should be expanded to protect upland habitats. There is no sound scientific reason to focus only upon wetland protection.

The ISMP states that vehicles, equipment and materials will be cleaned of remnant soils, vegetation, and debris before they are brought to the project area or moved to “...another wetland: within the construction [right-of-way]”. Again, this myopic focus upon protecting wetlands from biological invasion and not uplands has no scientific basis. It is advised that the same strategy be applied to upland areas.

The ISMP states that washing of construction vehicles on an elevated wash rack station will occur in sites “only where both” the construction equipment exits near a wetland identified in the ISMP as containing invasives *and* when the construction equipment is to enter an adjacent upland or another wetland within the next 1,000 linear feet along the construction right-of-way that are free of invasive species. Again, this should occur regardless of whether the system is a wetland or an upland.

The ISMP indicates that, if surface water is used for dust control, the equipment will be disinfected afterwards. While helpful, it would be of much greater value not to broadcast untreated surface water for dust control if there is a threat of invasive propagule contamination. This is a potential vectoring mechanism for invasives if the runoff collects, for instance, in a drainage ditch and ultimately reaches a new water body.

The ISMP clearly states that Constitution “*will not*” treat areas outside its proposed construction right-of-way for invasive species. This is highly problematic given that the edge habitat created by the Constitution project will encourage biological invasion in the adjacent forest lands for the entire service life of the right-of-way. Suppression costs will eventually fall upon the adjacent property owner should an infestation become established.

The ISMP language regarding the movement of soils, gravel, rock and other fill materials infested with invasive plants, “*will be avoided*” and “*to the extent practicable*” is grossly inadequate. This language should be changed to “shall be avoided” and to the “maximum extent technically feasible”.

- **Section 3.3.1 – Hydrostatic Pressure Testing**

The use of untreated surface water in massive quantities (16,592,520 gallons estimated for the New York section of the pipeline) for hydrostatic testing creates a large risk of vectoring invasive species. Untreated surface waters should be treated before release or returned and discharged within the same subwatershed from which they were collected. It is unrealistic to expect to discharge these volumes of water onto the surface and, given the topography of the region, not have overland transport into drainage pathways.

- **Section 3.4 – General Management Activities**

A three-year monitoring timeframe is inadequate to address latent seedbank germination and chronic edge effects. Invasive monitoring and treatment should constitute a routine maintenance activity for the entire life span of the right-of-way.

- **Section 4.0 – Summary/Conclusions**

The statement that, *“The proposed management activities outlined within this plan will prevent the inadvertent spread of existing populations of invasive plant species and will promote the establishment of native plant populations”*, is not accurate. The proposed strategies are not adequate for invasive suppression given the scale and nature of the landscape disturbance that is proposed by Constitution.

SUMMARY

The documentation and proposed mitigation strategies submitted by Constitution do not provide an adequate assessment of the probable impacts associated with the rapid conversion of forested ecosystems to natural gas pipeline right-of-way. They also fail to recommend potential mitigation strategies and options that would offset and reduce the “significant” impacts anticipated for native terrestrial ecosystems. Protection of these terrestrial ecosystems is critical to the continued health of the regions’ aquatic resources. Inadequate attention has been given to the following vital considerations: forest edge creation, forest fragmentation, interior forest loss, invasive species proliferation, ecological

restoration of temporary working spaces, and cumulative impacts. In addition, the Draft EIS fails to fully address a range of fundamental impacts associated with the project proposal.

Should the Certificate of Public Convenience and Necessity be issued by FERC without substantial changes to these construction and management plans, widespread disruption of forest ecosystems and local watershed resources will occur. Restoration of these systems following the eventual cessation of natural gas extraction will be a monumental cost incurred by both the taxpaying public and adjacent private property owners.

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