Chapter 4 Environmental Consequences

4.1 Introduction

The nature of the Proposed Action, including the NCL that comprise the affected environment, the variety of Covered Activities, the uncertainty about the future locations, timing or intensity of future Covered Activities, and the nature of the adaptive management approach being considered, do not allow for detailed, site-specific impact analyses. As such, all direct and indirect impact analyses in this EIS are conducted and presented herein at a programmatic level. HCP species are treated at a programmatic level as well, but as in the HCP itself, they are evaluated using reasonable worst-case scenarios to predict the manner and extent of anticipated take. As discussed in Chapter 1, potential impacts are discussed in general terms, under the basic tenet that the Proposed Action of issuing NiSource an ITP and subsequent implementation of its HCP, does not itself permit any pipeline operations, maintenance, or construction projects that may cause take of a species, including activities associated with the HCPs Conservation Strategy (e.g., future permitting associated with stream restorations, habitat improvements, etc.). Given that, issuance of an ITP and approval of the HCP itself would not directly or indirectly impact resources in the NCL footprint, though in some cases, (e.g., Biological Resources, Surface and Ground Water), HCP implementation, which includes additional AMMs and mitigation for HCP take species, may provide incidental benefits to these resources. It must be noted, that with the exception of “additional” AMM or mitigation measures associated with ITP issuance, future activities associated with pipeline operations (O & M, new construction) would be similar under all alternatives, including the No Action Alternative.

For all NiSource Covered Activities, future permitting, authorization and approvals will be required from other federal, state and local governmental agencies. For federal agencies, those processes may require independent NEPA review. Given the very general nature of the analysis in this document, subsequent NEPA compliance will necessarily need to be thorough and searching. Nevertheless, many of the anticipated impacts to the human environment from these future pipeline activities are common to all alternatives for Physical, Biological, and Social Resource components. We describe these in general terms.

Programmatic Approach

Unlike a traditional incidental take permit (ITP), the proposed action entails considerable involvement of other federal agencies in the authorization, approval or licensing of covered activities in the future. As such, the cooperating agencies, and other federal agencies, will be required to make separate and independent decisions regarding these future actions and they will be required to comply with NEPA when doing so.

In cases where a broad plan, program, or project will later be translated into site specific projects, subsequent analyses are referred to as "tiered" analyses. Tiering refers to the coverage of general matters in a broader EIS with subsequent narrower EISs or environmental assessments (EAs) incorporating by reference the general discussions and concentrating solely on the issues specific to the EIS or EA subsequently prepared. Traditionally tiered NEPA analyses are completed by the agency that issues the programmatic EIS and a Record of Decision (ROD). Here, the U.S. Fish and Wildlife Service will issue a ROD for its incidental take permit. But we do not anticipate that the cooperating agencies will sign or adopt that ROD. Rather, pursuant to CEQ NEPA regulations, they will be encouraged to "tier" off the programmatic EIS by adopting relevant portions of that document.

In this case, given the limitations of this EIS, considerable environmental analysis will be required of subsequent NEPA documents. In other words, mere adoption of this EIS, will not suffice to comply with NEPA, especially given the potential for localized and cumulative impacts that have yet to be examined. This EIS is not "sufficiently comprehensive or adequate" to allow it to simply be adopted in its entirety. Action agencies will be expected to provide thorough analyses of the affected environment and the environmental consequences, including cumulative effects, on a site-specific basis. Although this EIS provides only the most general analysis, it offers some guidance as factors that should be examined in agencies' subsequent NEPA analyses. The agencies, however, are responsible for fully evaluating the environmental consequences, and determining the level of impacts and their significance.

In furtherance of their continuing NEPA obligations, the agencies intend to enter into a memorandum of understanding (MOU), which will further identify their respective regulatory authorities and process for undertaking coordinated NEPA reviews through the duration of the ITP. Incidental take coverage under the terms of the permit will be conditioned on NiSource

having obtained all necessary governmental approvals, permits or licenses, which will include any required NEPA compliance prior to undertaking a covered activity.

Common Elements Associated with all Alternatives, Including the No Action

Estimated Annual Disturbance

In its HCP, NiSource estimated the annual average disturbance anticipated from both general O&M and construction activities to be at 19,409 acres. In short, NiSource estimates that 18,505 acres would be impacted within previously disturbed lands (i.e., existing ROW and existing compressor station lands) each year, most of which would consist of vegetation maintenance. New disturbance from construction, including establishment of new ROW, new storage fields, and the like would likely account for 904 acres annually.

The HCP states that this annual acreage total equates to a total annual disturbance of approximately 0.2-percent of the NCL footprint; 0.19-percent of which is within the existing ROW and 0.0092-percent of which would represent new disturbance. Over the 50-year life of the permit, the total new-disturbance acreage impact from all Covered Activities is estimated to be approximately 45,200 acres within the NCL area, which represents less than one half of one percent of the total acreage of the NCL.

NiSource also divided the total 19,409 annual average acres of impacts into four categories of activities: ROW maintenance, other O&M, Medium Capital Expansion Projects, and Large Capital Expansion Projects. NiSource defines Medium Capital Expansion Projects as the construction of a new pipeline up to 50-miles in length, the drilling of up to 30 wells with existing storage fields, and the addition of up to four compressor stations. NiSource estimates there will be 25 such projects over a 50-year timeframe (one every two years). NiSource defines Large Capital Expansion Projects as construction of new pipelines between 50 and 200-miles in length. NiSource estimates there will be 10 such projects over a 50-year timeframe (one every five years). [MSHCP Chapter 2.3.3]

Of these four categories, annualized impacts of 19,409 acres were broken down as follows: a total 16,667 acres for ROW maintenance, 1,102 acres for other O&M activities, 670 acres for Medium Capital Expansion projects, and 970 acres (on average) for Large Capital Expansion projects.

ECS Compliance

Regardless of the alternative that is ultimately selected, NiSource has and will continue to implement its Columbia Gas ECS (2008), Columbia Gulf ECS (2008), and Virginia ECS (2008), which are consistent with FERC Plans and Procedures, (hereto referred to commonly as "NiSource's ECS") to avoid and minimize impacts to HCP Species and other resource areas. NiSource's standards set the minimum requirements that must be followed in order to undertake appropriate pipeline and other facility construction, operation, and maintenance activities, including ROW maintenance and monitoring, particularly in environmentally sensitive areas (NiSource 2010a). The ECS is also used as a basis for individual project-specific EM&CP as required. In addition, NiSource requires a trained Environmental Inspector be responsible for implementing and assuring compliance with all project specific EM&CPs. Potential impacts from NiSource activities for the various resources discussed below are based on historical experience when completing projects of a similar nature. Additionally, as these "past" projects had undergone regulatory approval (e.g., FERC NEPA review and certification), Best Management Practices, or other measures required to reduce or avoid resource impacts of these past projects would be anticipated to be similarly required for any future projects to be undertaken by NiSource or its subsidiaries.

As discussed in Chapter 2, components of all action alternatives, including the Proposed Action, build off of NiSource's ECS and any required EM&CPs for individual projects by adding species-specific AMMs. For Alternatives 2 and 3, these additional measures also include mitigation commensurate with the anticipated take of ESA-listed species covered in the HCP.

4.2 Physical Resources

4.2.1 Surface Water

Analysis of surface water resources includes a discussion of potential impacts to natural water found above the ground surface associated with the NCL; examples include lakes, ponds, rivers, streams, springs, and other wetlands. Semi-permanent manmade water features such as reservoirs, retention ponds, ponds, canals, and regularly flooded ditches are also considered.

For all alternatives, including the No Action Alternative, construction-related direct and indirect impacts to surface water resources could occur from future Covered Activities, specifically earth-disturbing activities on NCL prone to erosion and projects directly associated with rivers and streams. Examples of such activities include hydrostatic testing, disturbance associated with clearing and grading of stream banks, in-stream trenching, trench dewatering, blasting, and

backfilling (see Section 2.2 of the NiSource MSHCP for a complete list of activities). Impacts from such activities may arise due to lack of shading based on clearing, temporary suspension of sediments from grading and trenching, impacts to aquatic organisms or increase in turbidity due to in-stream blasting, and potential release of drilling fluids during HDD.

NiSource's ECS (Section III)(see Appendix B) outline specific requirements to minimize water-related impacts of from construction and ROW maintenance, as well as construction of other facilities including wells, compressor stations, HDD locations, and measurement/regulation stations. These include:

- installation of equipment bridges,
- use of sediment traps for impounded water (or something similar) prior to trenching,
- use of sediment fence/filters for trench spoil,
- restricting use of herbicides or pesticides within 100-feet of a water body or wetland,
- spill prevention, containment and control measures which prohibit field storage of fuel within 100-feet of water bodies, and
- seasonal restrictions (related to cold water, cool water, and warm water fishery streams to include agency notification) during construction of water crossings.

In addition, NiSource is required to obtain other federal permits, as well as state and local authorizations, to protect surface water resources. As mandated by law, all required permits and authorizations must be in place before NiSource initiates its Covered Activities. For example, the USACE administers the Section 404 permit program that restricts the discharge of dredged or fill material into waters of the U.S., including wetlands, and establishes mitigation requirements for authorized impacts. The National Pollutant Discharge Elimination System (NPDES) stormwater program requires construction site operators engaged in clearing, grading, and excavating activities that disturb one acre or more to obtain coverage under an NPDES permit for their stormwater discharges. NiSource must submit a Storm Water Pollution Prevention Plan (SWPPP) to the appropriate state agency (or EPA if no state program exists) for concurrence that the plan for construction activities are completed in a manner that minimizes erosion and runoff into receiving waters. Other permits that may apply include

locally-administered floodplain development permits under the National Flood Insurance Program and various other local and state permits that may exist related to protecting water quality, surface water resources, and wetlands.

Additional AMMs included as part of the Action Alternatives (2 and 3) have been designed to protect water-dependent HCP species. These measures may have the incidental benefit of reducing or avoiding impacts to surface water resources above and beyond those provided in the ECS or required by other regulatory agencies. We recognize, however, that these additional benefits may only accrue in those areas where the ESA-listed species occur or are presumed to occur. These ESA-specific AMMs in the HCP, which may incidentally benefit surface water resources can be summarized as follows (detailed AMMs for each species appear in Chapter 6 of the HCP):

- Avoiding construction of culverts or graveled ford across water bodies or riparian occupied habitat;
- Use of flumes to minimize flow disruption in stream habitat;
- Ensuring that upland work does not result in impacts to adjacent water habitats;
- Use of HDD techniques, where feasible, or other trenchless methods for pipeline construction or replacement across water habitats;
- Installing pipelines to a minimum depth at least 10-feet horizontally outside the high water line in riparian areas;
- Avoiding installation of pipelines or performing in-channel repairs within occupied water habitats;
- Working from a lay barge or temporary work bridge rather than operating heavy equipment in-stream;
- Removing equipment bridges as soon as practicable;
- Inspecting for and correcting bank destabilization associated with the pipeline within occupied water habitats;

- Ensuring that work within streams does not result in impacts to adjacent habitats or karst features;
- Avoiding work in channelizing streams; and
- Crossing perennial streams only during specified periods.

Compliance with NiSource's pre-existing ECS, the regulatory requirements related to USACE's Section 404 permits, the NPDES permit for construction projects, other state and local permits, along with the range of AMMs identified in the HCP (for Alternatives 2 and 3), would minimize the potential for impacts to surface water resources associated with future pipeline activities.

NiSource mitigation measures, including protection and restoration of riparian buffers on rivers and streams with covered mussel species (e.g., clubshell, fanshell, sheepnose, James spinymussel) should produce a net benefit to surface water quality, resulting in conservation benefits to a variety of aquatic organisms. Riparian restorations that meet minimum NRCS standards for water quality and riparian corridors (see Appendix L of the HCP) will be designed to moderate surface water temperatures, provide nutrient inputs, and reduce sediments and other contaminants along occupied streams, thereby improving the quality of the water and associated habitat.

4.2.2 Ground Water

Analysis of ground water resources includes a discussion of impacts to natural water found underneath the ground surface within the NCL area, including aquifers, water supply wells, springs, and wellhead protection areas.

NiSource's future activities, whether associated with implementing the HCP or not, particularly construction activities and storage field operations, have the potential to directly or indirectly impact localized ground water resources and NiSource's ECS currently outlines strategies for minimizing potential impacts. For instance, any blasting that occurs during construction can potentially impact water quality and water quantities in wells and springs near construction work areas. To address this potential, NiSource currently requires (and will continue to require), with landowner permission, pre- and post-blasting testing of water wells within 150-feet of the pipeline. Tests could include a pump inspection, testing flow rates and/or analyzing for bacteriological or other contamination. Based on test results, mitigation is made available to

landowners as necessary. Other potential impacts to groundwater may include variations in groundwater levels or turbidity due to trench excavation and dewatering in areas with shallow groundwater systems; or clearing and grading activities that might impact overland water flow and/or surface-to-groundwater infiltration rates. Such construction-related impacts are typically temporary as NiSource's standard practice (through ECS compliance) implements procedures for erosion controls, restoration of ground contours, and re-vegetation.

Another NiSource activity with the potential to impact groundwater resources is hydraulic fracturing associated with storage well installation, operations, and maintenance. Hydraulic fracturing involves high pressure injection of water-based slurry into a well or wells to break up the underlying geologic formation and expand or recondition the storage capacity of a storage field (well). This technique is used by NiSource to enhance or recondition existing storage wells within the covered lands. Typical depths of NiSource's storage field well fracturing is between 2,000-6,000-feet (NiSource 2010c) well under the groundwater supply commonly used for domestic or otherwise potable water supply. Because the impacts occur at these depths below the surface, there is no anticipated impact to endangered species that live on or near the surface.

Hydraulic fracturing has been the subject of some public scrutiny in parts of the country that have experienced negative environmental consequences when the water is inadequately treated at disposal facilities and released into the environment. The injection water is high in salinity and dissolved solids and must be properly treated prior to release. NiSource water disposal is completed at one facility in Lawrence County, Pennsylvania, for activities that would fall within the Covered Activities. This facility releases its treated water into the Shenango River and it has been determined that the affected stretch of river does not contain threatened or endangered mussels. It is important to note that there is a significant difference between utilizing the technique for enhancement of existing storage wells, as NiSource does, and the use of the technique for exploration of potential natural gas sources. The public interest and controversy has emerged due to activities associated with hydraulic fracturing for exploration, which has more potential for negative environmental effects due to its use of a much greater volume of water to form the slurry used to create the required pressure.

At issue with respect to potential groundwater impact is the "leaking" or other contamination of potable groundwater aquifers with deep well injection water. To address this potential, NiSource practice is to cement off storage field wells to the bottom depth of the shallow aquifer,

and thus avoid any potential for interaction with deep water through migration up a well annulus and into contact with shallow water systems. In addition, disposal of injection water used to accomplish the fracturing is done in accordance with federal, state, and local regulations. Most states associated with the NCL have comprehensive regulatory standards for hydraulic fracturing and provide a general prohibition against pollution of any surface or subsurface fresh water from well completion activities. Wells are regulated by state authorities and/or federal EPA underground injection rules, and fracturing activities must be in compliance with associated permits relative to use and disposal of injection water. NiSource has concluded that the type of hydraulic fracturing they employ will have no impact on listed species that occur within the covered lands.

Some NiSource activities may help protect groundwater resources. AMMs designed to protect Indiana bat habitat will also protect potential recharge areas of cave streams and other karst features by employing the relevant NGTS ECS standards such as Section III, Stream and Wetland Crossings, and Section IV, Spill Prevention, Containment and Control. For example, drilling within 0.5 mile of known or presumed occupied hibernacula will be conducted in a manner that will not compromise the structural integrity or alter the karst hydrology of the hibernacula (e.g., outer drilling tube filled with concrete to ensure no modification to any karst encountered) (see related adaptive management discussion in Chapter 7 of the HCP). Equipment servicing and maintenance areas will be sited at least 300 feet away from streambeds, sinkholes, fissures, or areas draining into sinkholes, fissures, or other karst features.

As mitigation, NiSource will permanently protect important caves/karsts serving as Indiana bat hibernacula, including .25-mile buffer surrounding the cave/karst (see Section 6.2.1.6 of the HCP). Each of these action items will further minimize impacts to and potentially protect/restore groundwater resources, particularly for Indiana bat.

NiSource minimization and mitigation measures for Madison cave Isopod should improve ground water resources, at least locally. Madison cave isopod sites containing surface karst features will be protected and restored (see Section 6.2.3.6 of the HCP). Protected sites must contain either a cave or spring known to provide habitat for the Madison Cave isopod and its immediate recharge area, or a minimum of five surface karst features and a 300-foot buffer around each feature.

Implementation of any of the action alternatives is expected to result in minimal direct or indirect effects to local ground water resources in the NCL area.

4.2.3 Geology

Discussion of geologic resources includes potential impacts to surface and subsurface materials and their inherent properties, including topography, seismic characteristics, and soil stability within the NCL area.

In general, most NiSource Covered Activities do not include extensive or large-scale efforts that would change or impact geological features within the NCL area. All activities included in the HCP are activities which NiSource would continue to undertake regardless of the issuance of the ITP. As specific projects are initiated, local, state, or federal level permits or environmental review may be required depending upon the nature of the activity. As such, potential direct and indirect impacts on geologic resources would be considered in the future on a project-by-project basis and would need to be examined in-depth in subsequent NEPA analyses. Potential disturbance to, and minimization of impacts to geological resources would be similar under all alternatives given that NiSource would continue to follow required ECS and individual project EM&CPs as required. However, the additional AMMs outlined in the HCP for the action alternatives, which also serve to minimize impacts to geological resources would be implemented. These include NiSource's commitment to clearly mark karst feature buffers until ground disturbing activities are completed, and using an inverted filter to bridge karst features when filling new sinkholes. Contaminants, including but not limited to oils, solvents, and smoke from brush piles, will be strictly controlled as provided for in the EMCS and ECS, Section II.C.2, and Section IV so the quality and quantity of resources are not affected. Mitigation for Indiana bat and Madison cave isopod will provide long-term protection for some important karst features (see above). Implementation of additional protective measures may occur based on future site-specific environmental reviews.

Implementation of any of the alternatives is expected to result in minimal direct or indirect effect to local or regional geology, topography, or geological hazards in the NCL area.

4.2.4 Soils

The soils in the NCL area are very diverse due to the variety of climates, parent material, vegetation, landforms, and age of surface materials. Throughout the NCL area, six of the 12

NRCS soil orders are encountered, including Ultisols, Alfisols, Inceptisols, Entisols, Mollisols, and Histosols. Future NEPA analysis of soil resources associated with NiSource projects would include potential impacts to soil stability, soil erosion and soil contamination within the NCL area, including measures to avoid and/or minimize such impacts.

NiSource's ECS establishes specific requirements to maintain soil resources including standards related to clearing, grading, trenching, restoration, and stabilization. For example, temporary erosion controls must be installed immediately after the initial disturbance of soil. Also, when grading or trenching occurs topsoil must be stripped and stockpiled separately for residential or agricultural work areas to prevent the mixing of topsoil and subsoil. In addition, the NPDES stormwater program requires construction site operators engaged in clearing, grading, and excavating activities that disturb one acre or more to obtain coverage under an NPDES permit for their stormwater discharges. Agencies provide concurrence that construction activities are completed in a manner that minimizes soil erosion and eventual impacts to receiving waters. Under the No Action Alternative however, the additional AMMs outlined in the HCP which also serve to minimize impacts to soil resources (see below) would not be required as a condition of an ITP. Instead, implementation of such measures would likely vary given they would be dependent upon terms of individual future project-level environmental review.

With the action alternatives, AMMs included that go above and beyond the ECS requirements include measures that may also have secondary benefits of reducing impacts to soil resources for future NiSource projects. These include employing silt fences around construction areas and soil disturbance areas within "occupied habitat", using native material to backfill trenches, as well as refraining from blasting and drilling within a specified distance of occupied habitat of HCP Species (see Chapter 6 of the HCP for a complete list of AMMs). NiSource's spill prevention, containment and control measures outlined in the ECS help ensure that spills are contained within secondary containment structures and potential contact with soils is limited.

NiSource's standard BMPs, regulatory requirements related to submission of SWPPPs for construction projects, and AMMs that have been included in the HCP should avoid and minimize potential direct and indirect impacts to soil resources associated with these future activities under each of the alternatives, including the No Action Alternative, resulting in minimal direct or indirect effects to local soil resources.

4.2.5 Climate

According to the EPA, long-term observations indicate that our climate may be changing. As reported, greenhouse gases are at increased levels in the atmosphere. Global mean temperatures have increased 1.2 to 1.4ºF in the last 100 years according to NOAA and NASA, with most of the warming occurring in recent decades. Other aspects of the climate also appear to be changing, such as rainfall patterns, snow and ice cover, and sea level (EPA 2009). Global and regional climate models predict warming and increased variability in the timing and type of precipitation. As a consequence of these changes, fire regimes are likely to be altered, which, in some parts of the country, may result in increased fire frequency and intensity. Climate change may also have some direct effects on productivity and biogeography as well as indirect effects on vegetation through changes in fire, insect, and disease disturbances (Carroll et al. 2003; Dale et al. 2001; Parry et al. 2007). Some ecological communities are projected to move upward in both elevation and latitude (Walther et al. 2002). Therefore, since climate change is likely to manifest itself through other changed circumstances like flooding (as discussed in detail below), this MSHCP will discuss climate change as it relates to the accelerated rate of warming. Other potential consequences of climate change are discussed as stand-alone issues.

According to the American Meteorological Society, there are local and regional considerations that come into play when trying to project a pattern of global warming onto weather or climate conditions in a specific region. The American Meteorological Society explains that there are regional variations in the signature of climate change, with warming in the western U.S. but little or no annual temperature change occurring in the southeast U.S. in recent decades. Evidence for warming is also observed in seasonal changes with earlier springs, longer frost-free periods, longer growing seasons, and shifts in natural habitats and in migratory patterns of birds (American Meteorological Society 2007).

For the NCL, climate can vary substantially and is influenced by variations in elevation, topographic features, latitude, and proximity to the ocean. The potential for individual pipeline activities to influence or impact regional climate is considered extremely low. NiSource's activities currently do not include extensive or large-scale efforts that would influence regional climate within any portion of the NCL area. NiSource covered activities contemplated in this EIS neither extract nor use natural gas. Rather, NiSource is seeking permit coverage for the potential take of listed species associated with natural gas storage and transmission, which in and of itself, will not contribute to emissions. Further, as future projects are undertaken, state or

federal environmental review may be required depending upon the nature of the activity. Potential direct and indirect impacts on climatic resources, including climate change, would be considered on a project-by-project basis and would be subject to potential conditions of project approval (i.e., FERC authorizations, etc.) that are outside the scope of this NEPA analysis and the issuance of the ITP.

Most climate change-related impacts to species covered in the NiSource MSHCP are likely to manifest through species life history changes. The following criteria are often used to help in determining which species may be susceptible to climate change-related impacts: 1) Species with highly specialized habitat needs; 2) Species with narrow environmental tolerances; 3) Species dependent on specific environmental triggers or cues; and 4) Species that lack the ability to disperse and/or colonize new or more suitable areas.

Aquatic and terrestrial biomes are effective biological “scrubbers” of atmospheric carbon, a major component of greenhouse gases. The Service regards ecosystem protection and restoration important aspects of controlling carbon, both in terms of preventing loss of carbon currently stored in the terrestrial biosphere and as natural sequesters of carbon. The mitigation actions proposed in the HCP would preserve and restore land and water, and would enhance carbon sequestration. For instance, for Indiana bat mitigation alone, NiSource plans to protect and restore up to 8,000 acres of forest land, This may contribute toward efforts to mitigate human-induced global climate changes.

4.2.6 Air Quality

Analysis of air quality includes a discussion of impacts to, or exceedances of air quality standards within the NCL area due to future NiSource pipeline activities. The ambient air quality in an area can be characterized in terms of compliance with the primary and secondary NAAQS. The CAA, as amended, requires the EPA to set NAAQS for pollutants considered harmful to public health and the environment.

Compliance with the CAA and NAAQS, as well as any additional state-specific regulations for air quality within the NCL area, would occur on a project-by-project basis for those NiSource Covered Activities requiring additional state or federal approvals and including O&M. Impacts to air quality associated with these future projects, while thought to be minor, could include short-term, local air quality degradation related to ground disturbance and/or internal combustion exhaust from heavy machinery or generators, although compliance with ECS and requirements

of other existing (for O&M) and future permits or approvals would likely reduce or eliminate the chance of air quality exceedance of NAAQS or local ordinances.

4.3 Biological Resources

4.3.1 Vegetation

Analysis of vegetation includes a discussion of potential direct and indirect impacts on habitat and vegetation encountered within the NCL area.

Under all alternatives, NiSource would continue to pursue future construction, operations, and maintenance activities as it currently does by obtaining all individual permits and approvals by the appropriate Federal permitting authorities (i.e., FERC, USACE, FWS, etc).

NiSource's ECS (in particular Section II) establish specific standards related to clearing activities that take place prior to construction as well as post-construction restoration of plant communities for upland and wetland areas, along with areas around water body crossings. The ECS also detail required vegetation management during normal ROW maintenance and monitoring (Section V). For instance, following construction, NiSource has an established protocol to begin restoration within six days of final grading, assuming weather and soil conditions allow. Restoration includes fertilizer and lime application (in upland areas) along with seeding and mulching of the ROW or well site area. NiSource has established specific application rates and seed mixes that must be followed, unless an existing ROW agreement; permit; or local, state, or federal agency has other site-specific requirements that must be met.

However under the No Action Alternative, the additional AMMs outlined in the HCP which also serve to minimize impacts to species habitat and vegetation, or land protection that results from required mitigation, would not be required as a condition of the ITP. Instead, implementation of such measures would likely vary given they would be dependent upon terms of individual project-specific permits or authorizations (with Section 7 Consultations) as well as future project-specific environmental review.

With either of the action alternatives, AMMs include a range of measures that may also have secondary benefits of reducing impacts to the habitat and vegetation which Covered Species (as well as general flora and fauna) depend upon. For example, dependent upon the specific species habitat in question, NiSource has committed to:

- Avoid stepping on hummocks and tussocks
- Avoid pulling woody vegetation out by the roots in identified habitat
- Place restrictions on mowing
- Avoid dragging vegetation through occupied habitat
- Avoid burning brush piles within a specified distance of occupied habitat
- Re-vegetate disturbed habitat in accordance with the ECS
- Leave piles of woody debris along edge of ROW if clearing vegetation
- Avoid additional clearing of trees
- No woody vegetation or spoil disposal within occupied habitat
- Retain snags, dead/dying trees, and trees with exfoliating bark
- Maintain a diversity of open, herbaceous habitat
- Thoroughly clean all equipment prior to use to avoid inadvertent introduction of exotic species

NiSource's ECS, site-specific requirements already in place, and certain AMMs included in the HCP are expected to minimize the potential for direct and indirect impacts to habitat and vegetation. As such, issuance of an ITP and implementation of the HCP would have minimal long-term direct or indirect impacts on vegetation within the NCL area, given the requirements for restoration and revegetation. Future projects involving ground disturbance would have short-term direct impacts to vegetation but restoration to native vegetative cover associated with ECS requirements (and AMMS where applicable) would eliminate any potential for long-term impacts.

4.3.2 Wetlands

Analysis of wetland resources includes a discussion of potential direct and indirect impacts of future NiSource activities due to the alternatives considered, on those transitional areas between terrestrial and aquatic systems in the NCL area where water covers the land, or is

present either at or near the surface of the soil all year or for varying periods of time during the year, including during the growing season. On a national level, jurisdictional wetlands include those wetlands subject to regulatory authority under Section 404 of the CWA as well as EO 11990 (Protection of Wetlands). Many states also have state-level regulations that further protect wetland areas, including isolated wetlands not subject to federal regulations.

With all alternatives, NiSource would continue to pursue future construction, operations, and maintenance activities as it currently does by obtaining all individual permits and approvals, including seeking individual permits, such as 404 permits. In general, construction-related impacts from future projects to wetland resources, similar to surface water resources, could occur due to clearing and grading in, and around, wetlands, along with ground disturbing activities such as trenching, blasting, and backfilling, among others. Specific types of impacts to wildlife habitat, including any T&E species dependent on wetland habitat, due to clearing activities are discussed in **Sections 4.3.3** and **4.3.4**, respectively.

NiSource's ECS (Section III (B)) establish specific requirements to protect wetlands, including that all wetlands be marked by a professional prior to construction. In addition the ECS establish standards related to crossing techniques, clearing, grading, trenching, blasting, backfilling, and restoration work within wetlands. Examples include working with appropriate government agencies to minimize the impacts of new construction or ROW maintenance in wetlands per Section 404 of the CWA and any state-specific regulations, installation of equipment bridges, segregating topsoil over the trench line in non-saturated wetlands to avoid mixing of topsoil and subsoil, restricting use of herbicides or pesticides within 100-feet of a wetland, restoration of pre-construction contours and elevations, revegetation, use of HDD construction as feasible, and prohibiting storage of hazardous materials within a wetland or within 100-feet of a wetland boundary.

For the action alternatives, potential impacts to wetlands would also include AMMs (although site-specific for some species such as bog turtle) that contain a range of species-specific measures that may also have secondary benefits of reducing impacts to wetland resources. Some of the AMMs that help to protect wetland resources include efforts to:

- Abide by staging areas location restrictions
- Ensure that all imported fill material is free from contaminants

- Use enhanced and redundant spill control for storage well activities in wetlands
- Avoid use of fertilizers within a specified distance of wetlands
- Avoid use of herbicides within a specified distance of wetlands
- Follow standard policies and procedures for herbicide use in proximity to wetlands
- Avoid stepping on hummocks and tussocks
- Avoid pulling woody vegetation out by the roots in identified habitat

NiSource's standard BMPs, regulatory requirements related to USACE's Section 404 permit, other state and local permits, and AMMs (for the action alternatives) that have been included in the HCP all serve to minimize the potential for direct or indirect impacts to wetland resources from future NiSource activities. As such, we believe impacts to wetland resources associated with permit issuance and HCP implementation will be minimal.

4.3.3 Wildlife and Fish

Analysis of wildlife and fish includes a discussion of direct and indirect impacts to non-ESA listed wildlife and fish species encountered within the NCL area.

NiSource's future activities could potentially directly and indirectly impact a variety of non-listed wildlife and fish species. Under all alternatives, impacts to non-listed wildlife and fish species would be avoided and minimized through implementation of ECS. Under Alternatives 2 and 3, additional measures (AMMs) will be implemented which may have secondary benefits of reducing impacts where they occur with ESA-listed species. For example, NiSource has committed to:

- Place and timing restrictions on mowing;
- Re-vegetate disturbed habitat in accordance with the ECS;
- Leave piles of woody debris along edge of ROW if clearing vegetation (where appropriate);
- Avoid additional clearing of trees;

- No woody vegetation or spoil disposal within occupied habitat;
- Retain snags, dead/dying trees, and trees with exfoliating bark;
- Maintain a diversity of open, herbaceous habitat; and
- Thoroughly clean all equipment prior to use to avoid inadvertent introduction of exotics

NiSource's ECS, site-specific requirements already in place, and AMMs included in the HCP reduce potential for direct and indirect impacts to non-listed wildlife from future NiSource activities.

The action alternatives both include a mitigation program that has the potential to benefit a number of non-ESA-listed species that occur in the areas ultimately protected and/or restored.

As discussed in Chapter 3, migratory birds are protected by the MBTA of 1918 (16 USC 703-711), the Convention for the Protection of Migratory Birds with Great Britain on behalf of Canada of 1916, the Convention for the Protection of Migratory Birds and Game Mammals-Mexico of 1936, the Convention for the Protection of Birds and Their Environment-Japan of 1972, the Convention for the Conservation of Migratory Birds and Their Environment-Union of Soviet Socialist Republics of 1978, and EO 13186 (66 CFR 3853), which serve to protect migratory birds from adverse impacts of federal impacts. One hundred and fourteen species of migratory birds of conservation concern potentially occur within the NCL (Appendix D). Four species: the Eskimo Curlew, Ivory-billed Woodpecker, Kirtland's Warbler, and Whooping Crane, are considered imperiled at a global scale, and are listed as Endangered by the USFWS. Six additional species: the Brown Pelican, Least Tern, Piping Plover, Red-cockaded Woodpecker, Roseate Tern, and Wood Stork are also listed as Endangered by the USFWS. The remaining 103 species are declining within portions of their range; being endangered, threatened or monitored at a state level. While the species in Appendix D are the migratory species at greatest risk within the NCL, the MBTA provides protection for all migratory birds; thus additional migratory species not listed within the table would also potentially be affected by the project.

NiSource's ECS have established standards to minimize overall impacts to migratory birds from construction and O&M activities. The ECS standards include stipulations and standards related to mowing, clearing, grading, trenching, water body crossings, spill prevention, containment and

control, and final restoration and stabilization. For the action alternatives, the additional AMMs outlined in the HCP should further minimize impacts to migratory birds where they overlap with the HCP species. These additional benefits would not accrue under the No Action Alternative. Instead, implementation of such measures, including any mitigation to protect species habitat, would likely vary given they would be dependent upon terms of individual future project-specific Section 7 Consultations and NEPA review.

4.3.4 Bald and Golden Eagles

As discussed in Chapter 3, bald and golden eagles are protected by the BGEPA, MBTA, and the Lacey Act. While the bald eagle is no longer protected under the ESA, the USFWS developed National Bald Eagle Management Guidelines (http://www.fws.gov/pacific/eagle/NationalBaldEagleManagementGuidelines.pdf) to aid in land management decisions, including a suggested ½-mile activity buffer from identified active eagle nests. While a number of NiSource's ECS and AMMs have the potential to minimize impacts on eagles from construction and O&M activities, such as pre-activity surveys, minimization of tree clearing, and maintenance of snags, no specifications are in place as part of the ECS or HCP that would be considered sufficient protection for eagles without additional permitting outside the scope of this EIS. For more information on permits that may be required if an eagle nest is located within a ½-mile of any activity site, refer to the USFWS web site at: http://www.fws.gov/midwest/MidwestBird/eaglepermits.

4.3.5 T&E and Candidate Species

The following provides a discussion and analysis of potential impacts to fish, wildlife, and plant species under the jurisdiction of the Service and listed as either threatened, endangered, or candidate species known or suspected to occur within the NCL area. This includes 43 species that NiSource analyzed as part of its HCP, and 44 other species identified in Section 3.3.4 of this DEIS, which will also be evaluated in the Service's Biological Opinion.

Alternative 1 – No Action Alternative

Under the No Action Alternative, NiSource would continue to pursue future construction, operations, and maintenance activities as it currently does by obtaining all individual permits and approvals, as needed. Federal agency (FERC, USACE, USFS, NPS, Service) Section 7 consultations associated with future NiSource projects would continue to occur on a project-by-project basis. NiSource's future activities could potentially directly or indirectly impact any

number of the threatened, endangered, or candidate species thought to occur within or in proximity to the NCL, depending upon the nature of the activity, timing, and location. For instance mowing activities or driving along an existing ROW could result in direct impacts (injury or death) to individual species, or clearing or trimming of trees to maintain existing or establish new right-of-way may also adversely modify designated critical habitat. The nature of these activities, and potential impacts, as well as the exact locations, type of species involved, and timing of the work are impossible to estimate or gauge, although NiSource has indicated in its HCP that they estimate an annual disturbance for the O&M and new construction activities would likely approximate 19,000 acres, with most of this (16,667 acres) occurring within the existing ROW.

NiSource's ECS have established standards to minimize overall impacts, including to wildlife, of construction and O&M activities. The ECS standards include stipulations and standards related to mowing, clearing, grading, trenching, water body crossings, spill prevention, containment and control, and final restoration and stabilization. Under the No Action Alternative, the additional AMMs outlined in the HCP (and presented below under the Proposed Action) that also serve to minimize and/or avoid impacts to threatened, endangered, or candidate species or their habitats would not be required as a condition of the ITP. Instead, implementation of the ESA through formal Section 7 consultation would require some variation of these AMMs to protect species or habitat, depending on the nature of the specific proposed.

Alternative 2 - Issuance of a 50-year ITP and Approval of the NiSource HCP (Proposed Action)

Alternative 2 would entail the service issuing NiSource an ITP for take associated with Take Species as determined through its analyses in the associated HCP. The following provides a discussion and summary of potential impacts to the 43 HCP species from future NiSource Activities as described in the HCP as Covered Activities. This section also provides descriptions of AMMs that NiSource and the Service have developed to be implemented in conjunction with future NiSource activities. These AMMs would need to be employed in order for those future activities to be in compliance with the ITP and assure incidental take coverage for NiSource relative to the HCP species.

HCP Species

Of the 43 species covered in the HCP, 24 "No Effect" determinations have been made, including; Blackside dace, Braun's rock cress, Cumberland bean pearlymussel, Cumberland snubnose darter, Delmarva fox squirrel, Dromedary pearlymussel, Gulf sturgeon, Karner blue butterfly, Lake Erie water snake, Louisiana pearlshell, Maryland darter, Mead's milkweed, Mitchell's satyr butterfly, Pale liliput pearlymussel, Pitcher's thistle, Puritan tiger beetle, Purple cat's paw pearlymussel, Scioto madtom, Shenandoah salamander, Slackwater darter, Tan riffleshell, West Indian manatee, White cat's paw pearlymussel, and White wartyback pearlymussel. These No Effect determinations were based primarily on our examination of the species proximity to anticipated future disturbance from NiSource activities. Where known or presumed species occurrences did not overlap with the NCL, or that impacts from NiSource activities would not cause impacts to the species or their habitats, we determined there would be "no effect."

After determining that 23 of the 43 species would not be affected, 19 species remain. Implementation of AMMs developed for nine of these species will reduce the likelihood or severity of adverse impacts to a point where no take of the 19 is now anticipated. These species include; Birdwing pearlymussel, Cheat mountain salamander, Cracking pearlymussel, Cumberland monkeyface pearlymussel, Gray bat, Interior least tern, Oyster mussel, Louisiana black bear, and Virginia big-eared bat. These "not likely to adversely affect" determinations were made based on initial determinations by the Service (USFWS 2007e), species range and known occurrences relative to the location of the NCL, the types and anticipated impacts of Covered Activities, and through the development of mandatory species-specific AMMs.

Take caused by covered activities is likely for the 10 remaining species. Given this, NiSource has requested incidental take for them (see **Table 4.3-1**). Take calculations vary by species. For terrestrial species, take numbers were calculated based on both the projected impact acres over the 50-year permit term as well as anticipated disturbance to individuals over the permit term, regardless of the type of disturbance.

For aquatic species, take numbers were derived based on three factors (estimated crossings) relating to water body disturbance over the permit term, including the likelihood of one new construction looping project, one replacement of the existing pipeline, and other additional activity impacts (e.g., stabilization, removal) over the 50-year permit term. This take calculation

assumes, however, that the three crossings (factors) in play would occur at a time interval sufficient to allow for full re-colonization to pre-disturbance densities.

Given NiSource's inability to specifically identify where future projects will occur within the NCL, coupled with the 50-year permit duration, the HCP could not predict the manner and extent of take with absolute certainty.

Table 4.3-1: Comparison of Alternatives Considered for Detailed Analysis

Species	Summary of Take Requested
Indiana bat	Incidental take (harass, harm, injure, kill) is requested for 2,637 Indiana bat individuals estimated to be present within no more than 69,151 acres of summer and/or spring staging/fall swarming habitat
Bog turtle	Incidental take is requested for impacts to turtles and habitat at 25 sites
Madison Cave isopod	Incidental take is requested for two populations within 2,764.5 acres of Madison Cave isopod habitat
Clubshell mussel	Incidental take is requested for up to 166 acres of clubshell mussel habitat
Northern riffleshell mussel	Incidental take is requested for up to 165.3 acres of northern riffleshell mussel habitat
Fanshell mussel	Incidental take is requested for 283.2 acres of fanshell mussel habitat
James spinymussel	Incidental take is requested for up to 12.8 acres of James spinymussel habitat
Sheepnose mussel	Incidental take is requested for up to 250.4 acres of sheepnose mussel habitat
Nashville crayfish	Incidental take is requested for up to 4.0 acres of Nashville crayfish habitat
American burying beetle	Incidental take is requested for 4 American burying beetle individuals

AMMs and Mitigation

NiSource has stated that it will utilize AMMs to reduce the likelihood of take for the 10 Take Species, and to avoid take altogether for the other nine species for which impacts are anticipated in the HCP. Species-specific AMMs were developed to address, to the maximum extent practicable, potential impacts to this list of 19 species identified as "may effect" HCP Species in Chapter 3. A master list summarizing these AMMs in generalized terms is presented in **Table 4.3-2**. Species-specific AMMs are described in full detail in the individual species' analysis presented in Chapter 6 and in Appendix F of NiSource's HCP and in **Appendix E** of this EIS.

In general, AMMs are related to the following categories: habitat and occupation surveys; measures to avoid and/or minimize impacts to species; preparation of an EM&CP; stream bed construction methods; stream bank conservation methods; timing restrictions on activities; specifications for pipeline abandonment; methods for dealing with possible contaminants; methods for withdrawal and discharge of water; travel and access road procedures; methods to deal with possible exotic species; vegetation management; routing criteria; and methods to minimize soil and geology impacts.

Table 4.3-2: Avoidance & Minimization Measures (AMMs) – HCP Species in Table 4.3-3

Habitat and Occupation Surveys	
A1	Determine habitat suitability for the species, or assume potential presence
A2	Survey to determine presence/absence within identified suitable habitat
Measures to Avoid and Minimize Impacts to Species	
B1	Bait the species away from the project area
B2	Trap and relocate species away from the project area
B3	Species education for operators, employees, and contractors
B4	Avoid activities involving long-term noise disturbance >75db within specified distance
B5	Strict control of "bear attractants" such as use of "bear-proof" waste disposal containers
B6	Designated critical habitat within ROW maintained to NGTS ECS env. sensitive area standards
B7	Remove buildings during winter months, or after a survey year round
Prepare an Environmental Management & Construction Plan	
C1	Prepare an Environmental Management & Construction Plan
Stream Bed Construction Methods	
D1	Consider HDD or other trenchless methods for install or replacement across habitat
D2	Install pipelines to a minimum depth at least 10-feet past the high water line in riparian areas
D3	Do not install In-Channel repairs within occupied habitat
D4	Work from a lay barge or temporary work bridge rather than operate heavy equipment in-stream
D5	Remove equipment bridges as soon as practicable
D6	Inspect for and correct bank destabilization associated with the pipeline within occupied habitat
D7	Ensure that work within streams does not result in impacts to adjacent habitats or karst features
D8	Avoid channelizing streams
D9	Cross perennial streams only during specified periods
D10	Use Dry-Ditch Dam and Pump methodology
Stream Bank Conservation	
E1	Do not construct culverts or stone access roads across waterbody/riparian occupied habitat
E2	Use sufficient half pipes to minimize flow disruption in stream habitat
E3	Ensure that upland work does not result in impacts to adjacent water habitats
Timing Restrictions	
F1	Timing restrictions to minimize impact
F2	Avoid construction activities after sunset in occupied habitat
Pipeline Abandonment	
G1	Pipeline abandonment specifications
Contaminants	

H1	Site staging areas location restrictions
H2	Ensure that all imported fill material is free from contaminants
H3	Use enhanced and redundant spill control for storage well activities in occupied habitat
H4	Avoid use of fertilizers within a specified distance of occupied habitat
H5	Avoid use of herbicides within a specified distance of occupied habitat
H6	Follow standard policies and procedures for herbicide use in proximity to occupied habitat
H7	Refuel equipment, check for leaks each day, and control contaminants as per the ECS
H8	Use tanks rather than waste pits to store waste fluids
H9	Contaminants should be controlled as provided for in the EMCS and ECS.
Withdrawal and Discharge of Water	
I1	Avoid discharging hydrostatic testing water from new pipe directly into occupied habitat
I2	Avoid drawing hydrostatic testing water directly from occupied habitat
I3	Discharge hydrostatic testing water down gradient or >300-feet upland from occupied habitat
I4	Use best available water withdrawal/discharge impact avoidance techniques
I5	Avoid discharging hydrostatic testing water from existing pipe directly into occupied habitat
Travel and Access Roads	
J1	Avoid driving across identified habitat
J2	Route new access roads a specified distance from occupied habitats
J3	With landowner consent, block access roads and ROWs leading to occupied habitat
Exotic Species	
K1	Thoroughly clean all equipment prior to use to avoid inadvertent introduction of exotics
Vegetation Management	
L1	Avoid stepping on hummocks and tussocks
L2	Avoid pulling woody vegetation out by the roots in identified habitat
L3	Restrictions on mowing
L4	Avoid dragging vegetation through occupied habitat
L5	Avoid burning brush piles within a specified distance of occupied habitat
L6	Re-vegetate disturbed habitat in accordance with the ECS
L7	Leave piles of woody debris along edge of ROW if clearing vegetation
L8	Avoid additional clearing of trees
L9	No woody vegetation or spoil disposal within occupied habitat
L10	Retain snags, dead/dying trees, and trees with exfoliating bark
L11	Maintain a diversity of open, herbaceous habitat
Routing Criteria and Construction	
M1	Avoid constructing bell holes and trenches in habitat areas
M2	Route new projects to avoid occupied or potential habitats
Soil and Geology Impacts	
N1	Employ silt fences around construction/soil disturbance areas within occupied habitat
N2	Blasting within a specified area of occupied habitat must ensure karst integrity is maintained.
N3	No HDD within the potential habitat zone
N4	Clearly mark karst feature buffers until ground disturbing activities are completed
N5	Use an inverted filter to bridge karst when filling new sinkholes
N6	Trenches to be backfilled using native material to specified depth where applicable
N7	Minimize alteration of existing grade and hydrology of existing surface karst features
N8	Drilling conducted in manor that will not compromise structural integrity of habitat/habitat features or alter hydrology
N9	Ensure restoration of pre-existing topographic contours after ground disturbance.

The majority of the AMMs listed for individual species are mandatory and must be applied to all Covered Activities. However, as previously discussed, there is a subgroup of AMMs that NiSource determined cannot feasibly be implemented in every instance due to location, technical or engineering feasibility, potential adverse impacts to other trust resources, project timelines, customer needs, or effectiveness. NiSource has stated that a decision regarding these "non-mandatory" AMMs will be made on a case-by-case basis, and these evaluation processes will be reported to the Service in its annual report.

NiSource has stated that species-specific AMMs supplement (and supersede if an inconsistency is noted) those BMPs included within NiSource's ECS documents and do not substitute for NiSource's already required pre-construction planning and project implementation specifications. Rather, the information gathered during the pre-construction planning and project implementation phases will be used to determine actual project impacts on HCP Species and used as the basis for the mitigation program, for situations where take would occur.

Where take is anticipate, the HCP provides for mitigation measures to compensate for the impact of the taking. These include, but are not limited to, permanent protection of existing habitat, habitat enhancement and restoration, habitat management to achieve and/or maintain specific biological characteristics; and species propagation and reintroductions. The HCP does not prescribe where on the landscape these mitigation actions will take place, but it does provide parameters and criteria to ensure that appropriate mitigation occurs.

HCP Species Assessments

Table 4.3-3 summarizes the 19 "may effect" HCP Species presented in Chapter 3 of this EIS. Specifically, for all species, the table: 1) identifies locations covered by the HCP; 2) documents which species can be documented as "not likely to adversely affect" based on implementation of AMMs versus those that are likely to be taken and will require mitigation for take; 3) summarizes both required and non-mandatory AMMs for each species. Additionally, the table includes a summary of activities resulting in impacts, lists types of impacts, and summarizes mitigation strategies associated with species take for the 10 Take Species. Complete species conservation frameworks and threats analysis tables are presented in **Appendix E** of this document, and Chapter 6 and Appendix F of the HCP.

Table 4.3-3: Impacts to HCP Species

Group	Common / Scientific Name	Federal Status	Locations within NCL	Activities Resulting in Impacts	Impacts Due to Covered Activities	AMMs[2]	Mitigation[3]
Mammals	Gray bat *Myotis grisescens*	Endangered	**Not likely to adversely affect** in Adair, Allen, Carter, Clark, Estill, Fayette, Garrard, Greenup, Lee, Letcher, Lincoln, Madison, Menifee, Metcalfe, Monroe, Montgomery, Morgan, Powell, and Rowan counties, KY; and Davidson, Hardin, Lewis, Macon, Maury, McNairy, Sumner, Trousdale, Wayne, Williamson, and Wilson counties, TN.	Not applicable	Not applicable	**Mandatory**: A1, A2, B3, D6, D7, H1, H5, H7, J3, L5, L6, L9, N2, N3 **Non-Mandatory**: D1, D3, D4, D5, D9, F2, G1, L8	Not applicable

Group	Common / Scientific Name	Federal Status	Locations within NCL	Activities Resulting in Impacts	Impacts Due to Covered Activities	AMMs[2]	Mitigation[3]
Mammals	Indiana bat *Myotis sodalis*	Endangered	**Impacts likely** throughout the entire NCL footprint in Indiana, Kentucky, Ohio, Pennsylvania, Tennessee, and West Virginia; and in Allegany, Garret, and Washington counties, MD; Hunterdon, Morris, and Warren counties, NJ; Orange and Rockland counties, NY; and Albemarle, Alleghany, Augusta, Botetourt, Clarke, Frederick, Giles, Greene, Lexington, Lexington City, Madison, Page, Rockbridge, Rockingham, Shenandoah, Warren, Waynesboro City, and Waynesboro counties, VA[1]	Tree clearing associated with a wide variety of activities, tree side-trimming, access roads maintenance and construction, equipment operation, well plugging, presence of the pipeline corridor, construction and maintenance of waste pits, and herbicide application	Direct impacts due to tree removal, crushing bats, increased predation, entrapment, noise, and chemical contaminants, which may kill/wound/ harm/harass if they are present during the work. Indirect impacts due to loss or degradation of roosting, foraging, and travel corridor habitats along the ROW (harassment).	**Mandatory**: A1, B3, C1, D6, D7, F1, H1, H5, H7, H9J3, L5, L6, L8, L9, N2, N8, N9 **Non-Mandatory**: A2, B4, D8, L10	Determine habitat mitigation need; including protecting and managing known swarming habitat, known and previously unprotected Priority 1 and/or Priority 2 hibernacula and associated spring staging/fall swarming habitat, and restoring winter habitat conditions in degraded caves or mines that exhibit potential for successful restoration. NiSource would also focus mitigation efforts at infected hibernacula. Determine appropriate multipliers and amounts for contribution to mitigation fund based on assumed impacts to individual species and habitats.
Mammals	Louisiana black bear *Ursus americanus luteolus*	Threatened	**Not likely to adversely affect** in East Carroll, Franklin, Iberia, Madison, Richland, and St. Mary parishes, LA; and Humphreys, Issaquena, Sharkey, Warren, and Washington counties, MS. **No effect** in Avoyelles and St. Landry Parish, LA	Not applicable	Not applicable	**Mandatory**: A1, B3, B4, B5, B6, L2, L3, L6, L8 **Non-Mandatory**: F1	Not applicable

Group	Common / Scientific Name	Federal Status	Locations within NCL	Activities Resulting in Impacts	Impacts Due to Covered Activities	AMMs[2]	Mitigation[3]
	Virginia big-eared bat *Plecotus townsendii*	Endangered	**Not likely to adversely affect** in Bath, Carter, Estill, Jackson, Lee, Madison, Menifee, Montgomery, Morgan, Owsley, Powell, and Rowan counties, KY; Augusta, Bland, Giles, Rockingham, and Shenandoah counties, VA; and Fayette, Grant, Hardy, McDowell, Pendleton, Preston, Randolph, and Tucker counties, WV.	Not applicable	Not applicable	**Mandatory**: A1, A2, B3, B6, D6, D7, H1, H5, H7, H8, J3, L5, L9, L11, N2, N3 **Non-Mandatory**: F2, M2	Not applicable
Birds	Interior least tern *Sterna antillarum*	Endangered	**Not likely to adversely to affect** in East Carroll Parish, LA; and Issaquena, County, MS. **No effect** in Grant and Madison parishes, LA; and Warren and Washington counties, MS.	Not applicable	Not applicable	**Mandatory**: A2, D6, F1, H1, **Non-Mandatory**: D1, G1	Not applicable

Group	Common / Scientific Name	Federal Status	Locations within NCL	Activities Resulting in Impacts	Impacts Due to Covered Activities	AMMs[2]	Mitigation[3]
Reptiles	Bog turtle *Glyptemys muhlenbergii*	Threatened	**Likely to impact** in New Castle County, DE; Baltimore, Cecil, and Harford counties, MD; Gloucester, Hunterdon, Morris, Salem, and Warren counties, NJ; Orange and Rockland counties, NY; and Adams, Bucks, Chester, Cumberland, Delaware, Lancaster, Lehigh, Monroe, Montgomery, Northampton, and York counties, PA.	Vehicle operation, vegetation management (mowing), vegetation management (herbicide application), temporary and permanent access road construction, vehicle operation, minor spill event, vegetation management (clearing), ROW (trenching - digging, blasting, dewatering, grading), wetland crossings (trenching - digging, blasting, dewatering, clearing, grading)	Habitat loss, degradation and fragmentation, chemical contaminants, loss of individuals, hydrologic changes, isolation, illegal collection and trade	**Mandatory**: A1, A2, C1, D1, D7, E3, F1, G1, H4, H5, H6, H7, I1, I2, I3, I4, J1, L1, L2, L3, L4, L5, L6, M1, M2, N1	O&M impacts: Habitat restoration and enhancement within ROW if possible. If not possible, off-ROW restoration and management will occur on a 1:1 basis. New Construction or conventional replacement methods: Protect and restore (as needed) bog turtle sites. Priority given to sites within a complex versus isolated sites.
Amphibians	Cheat Mountain salamander *Plethodon nettingi*	Threatened	**Not likely to adversely affect** in Grant, Pendleton, Pocahontas, Randolph, and Tucker counties, WV.	Not applicable	Not applicable	**Mandatory**: A1, A2, D1, D8, G1, H1, H4, H5, H6, H7, I1, I2, I3, J2, L3, L4, L5, L6, L7, L8, M2, N1 **Non-Mandatory**: J1, L2	Not applicable

Group	Common / Scientific Name	Federal Status	Locations within NCL	Activities Resulting in Impacts	Impacts Due to Covered Activities	AMMs[2]	Mitigation[3]
Crustaceans	Madison Cave isopod *Antrolana lira*	Threatened	**Impacts likely** in Augusta, Clarke, Page, Rockbridge, Rockingham, Shenandoah, and Warren counties, and the City of Waynesboro, VA.	Construction grading, trenching (digging, blasting), access road construction (temporary and permanent), wetland crossings (digging, blasting), HDD (removed as activity in range of this species), minor spill, pipeline abandonment	Loss, degradation, and/or fragmentation of habitat due to collapsing or filling in subsurface features and/or altering subsurface water quality and/or quantity. The changes in habitat would render them temporarily to permanently unsuitable for future use by the Madison Cave isopod and may prevent movements among or between populations. Any Madison Cave isopods present in the zones of impact would likely be killed by smothering or poisoning.	**Mandatory**: A1, A2, B3, D7, H1, H4, H5, H6, H7, I1, I2, I3,I4, I5, N2, N3, N4, N5, N7 **Non-Mandatory**: J3	Mitigation to be completed prior to commencing the activity causing the impact: protect key parcels (containing surface karst features) and restore surface karst features (if needed) within the immediate recharge areas of another known Madison Cave isopod occurrence
	Nashville crayfish *Orconectes shoupi*	Endangered	**Impacts likely** in Davidson and Williamson counties, TN.	Pipeline corridor presence, tree clearing, mechanical repair in upland or wetland areas, in-stream stabilization, existing road maintenance, culvert replacement, clearing and ground disturbance for cathodic protection, removal of abandoned pipe, tree, shrub, and herbaceous clearing, grading, regrading, water discharge related to hydrostatic testing, fertilizer application, temporary and permanent access roads, installation and removal of water diversion structures and equipment in stream, minor frac-out, and minor spill events	Sedimentation, riparian tree removal, crushing, altered flow, increased water temperature, substrate removal, sedimentation, chemical contaminants, facilitation of invasive species	**Mandatory**: A2, B2, C1, D1, D2, D3, D5, D6, D10, F1, H1, H2, H4, H5, I1, I2, I3, I4, J1, N6 **Non-Mandatory**: E1, G1,	O&M and Upland Disturbance: Restore and protect riparian buffers within identified priority areas New Construction and Repair at Stream Crossings: Restore, protect and enhance potential habitat within identified priority areas

Group	Common / Scientific Name	Federal Status	Locations within NCL	Activities Resulting in Impacts	Impacts Due to Covered Activities	AMMs[2]	Mitigation[3]
Mollusks	Birdwing pearlymussel *Lemiox rimosus*	Endangered	**Not likely to adversely affect** in Maury County, TN.	Not applicable	Not applicable	**Mandatory**: A2, B2, C1, D1, D2, D3, D5, D6, E2, H1, H2, H3, H4, H5, H6, I4, K1 **Non-Mandatory**: D4, E1, F1, G1, I1, I2, J1	Not applicable
	Clubshell mussel *Pleurobema clava*	Endangered	**Impacts likely** in Franklin, Madison, and Pickaway counties, OH; Armstrong and Clarion counties, PA; and Braxton, Clay, and Doddridge counties, WV **No effect** in Dekalb and Marshall counties, IN; Allen, Bath, Bracken, Mason, Pendleton, and Robertson counties, KY; Coshocton, Defiance, Delaware, Fairfield, Greene, Hancock, Trumbull, Tuscarawas, and Union counties, OH; Cattaraugus County, NY; Hardin County, TN; and Kanawha and Lewis counties, WV.	Pipeline corridor presence, vehicle operation, access road culvert replacement, access road maintenance, off-ROW clearing, mechanical repair and fill in ROW, in-stream stabilization, tree clearing, herbicide application, hydrostatic testing, pipeline abandonment, well abandonment, wet ditch crossing activities, access road construction, grading, HDD, hydrostatic testing, re-grading, fertilizer application, erosion control devices, herbaceous and woody vegetation clearing, stream bank contouring, installation and removal of stream crossing structures, trenching related impacts, waste pits, minor spill events, in-stream stabilization, and vegetation disposal	Sedimentation, chemical contaminants, increased water temperature, crushing, substrate compaction, altered flow, burying substrate, entrapment, water level reduction, introduction of invasive species, loss of habitat	**Mandatory**: A2, B2, C1, D1, D2, D3, D5, D6, E2, H1, H2, H3, H4, H5, I1, I2, I3, I4, K1 **Non-Mandatory**: D4, E1, G1, J1	See Table 4.3-4

Group	Common / Scientific Name	Federal Status	Locations within NCL	Activities Resulting in Impacts	Impacts Due to Covered Activities	AMMs[2]	Mitigation[3]
Mollusks	Cracking pearlymussel *Hemistena lata*	Endangered	**Not likely to adversely affect** in Hardin, Maury, and Wayne counties, TN.	Not applicable	Not applicable	**Mandatory**: A2, B2, C1, D1, D2, D3, D5, D6, E2, H1, H2, H3, H4, H5, H6, I4, K1 **Non-Mandatory**: D4, E1, F1, G1, I1, I2, J1	Not applicable
	Cumberland monkeyface pearlymussel *Quadrula rafinesque*	Endangered	**Not likely to adversely affect** in Maury County, TN	Not applicable	Not applicable	**Mandatory**: A2, B2, C1, D1, D2, D3, D5, D6, E2, H1, H2, H3, H4, H5, H6, I4, K1 **Non-Mandatory**: D4, E1, F1, G1, I1, I2, J1	Not applicable
	Fanshell mussel *Cyprogenia stegaria*	Endangered	**Impacts likely** in Bracken, Nicholas, Pendleton, and Robertson counties, KY; Coshocton, Meigs, Morgan, Muskingum, and Washington counties, OH; Hardin County, TN; and Jackson and Kanawha counties, WV. **No effect** in Allen, Barren, Boyd, Carter, Greenup, Lawrence, Lewis, Mason, Monroe, and Powell counties, KY; and Wood County, WV	Pipeline corridor presence, vehicle operation, access road culvert replacement, access road maintenance, off-ROW clearing, mechanical repair and fill in ROW, in-stream stabilization, tree clearing, herbicide application, hydrostatic testing, pipeline abandonment, well abandonment, wet ditch crossing activities, access road construction, grading, HDD, hydrostatic testing, re-grading, fertilizer application, erosion control devices, herbaceous and woody vegetation clearing, stream bank contouring, installation and removal of stream crossing structures, trenching, waste pits, minor spill events, in-stream stabilization, and vegetation disposal.	Sedimentation, chemical contaminants, increased water temperature, crushing, substrate compaction, altered flow, burying substrate, entrapment, water level reduction, and introduction of invasive species	**Mandatory**: A2, B2, C1, D1, D2, D3, D5, D6, E2, H1, H2, H3, H4, H5, H6, I1, I2, I3, I4, K1 **Non-Mandatory**: D4, E1, G1, J1	See Table 4.3-4

Group	Common / Scientific Name	Federal Status	Locations within NCL	Activities Resulting in Impacts	Impacts Due to Covered Activities	AMMs[2]	Mitigation[3]
Mollusks	James spinymussel *Pleurobema collina*	Endangered	**Impacts likely** in Albemarle, Alleghany, Botetourt, Goochland, Greene, Orange, Powhatan, and Rockbridge counties, VA. **No effect** in Giles County, VA; and Monroe County, WV	Pipeline corridor presence, vehicle operation, access road culvert replacement, access road maintenance, off-ROW clearing, mechanical repair and fill in ROW, in-stream stabilization, tree clearing, herbicide application, hydrostatic testing, pipeline abandonment, and well abandonment, dry-ditch crossing activities, access road construction, grading, horizontal directional drill (HDD), hydrostatic testing (withdrawal and discharge), re-grading, fertilizer application, erosion control devices, herbaceous and woody vegetation clearing, stream bank contouring, installation and removal of stream crossing structures, trenching related impacts, waste pits, minor spill events, and vegetation disposal.	Sedimentation, chemical contaminants, increased water temperature, crushing, substrate compaction, altered flow, burying substrate, entrapment, water level reduction, and introduction of invasive species	**Mandatory**: A2, B2, C1, D1, D2, D3, D5, D6, E2, F1, H1, H2, H3, H4, H5, H6, I1, I2, I3, I4, K1 **Non-Mandatory**: D4, E1, G1, J1	See Table 4.3-4

Group	Common / Scientific Name	Federal Status	Locations within NCL	Activities Resulting in Impacts	Impacts Due to Covered Activities	AMMs[2]	Mitigation[3]
Mollusks	Northern riffleshell mussel *Epioblasma torulosa rangiana*	Endangered	**Impacts likely** in Pickaway, County, OH; Armstrong and Clarion counties, PA; and Kanawha County, WV. **No effect:** in De Kalb County, IN; Bath, Pendleton, and Rowan counties, KY; Franklin, Madison, and Union counties, OH; and Braxton and Clay counties, WV.	Pipeline corridor presence, vehicle operation, access road culvert replacement, access road maintenance, off-ROW clearing, mechanical repair and fill in ROW, in-stream stabilization, tree clearing, herbicide application, hydrostatic testing, pipeline abandonment, well abandonment, wet ditch crossing activities, access road construction, grading, HDD, hydrostatic testing (withdrawal and discharge), re-grading, fertilizer application, erosion control devices, herbaceous and woody vegetation clearing, stream bank contouring, installation and removal of stream crossing structures, trenching related impacts, waste pits, minor spill events, in-stream stabilization, and vegetation disposal	Sedimentation, chemical contaminants, increased water temperature, crushing, substrate compaction, altered flow, burying substrate, entrapment, water level reduction, and introduction of invasive species	**Mandatory**: A2, B2, C1, D1, D2, D3, D5, D6, E2, H1, H2, H3, H4, H5, H6, I1, I2, I3, I4, K1 **Non-Mandatory**: D4, E1, G1, J1	See Table 4.3-4
	Oyster mussel *Epioblasma capsaeformis*	Endangered	**Not likely to adversely affect** in Maury County, TN. **No effect** in Monroe County, KY	Not applicable	Not applicable	**Mandatory**: A2, B2, C1, D1, D2, D3, D5, D6, E2, H1, H2, H3, H4, H5, H6, I4, K1 **Non-Mandatory**: D4, E1, F1, G1, I1, I2, J1	Not applicable

Group	Common / Scientific Name	Federal Status	Locations within NCL	Activities Resulting in Impacts	Impacts Due to Covered Activities	AMMs[2]	Mitigation[3]
Mollusks	Sheepnose mussel *Plethobasus cyphyus*	Candidate	**Impacts likely** in Bath, Boyd, Bracken, Clark, Fayette, Greenup, Lewis, Madison, Mason, Nicholas, Pendleton, and Rowan counties, KY; Sunflower County, MS; Adams, Brown, Clermont, Gallia, Lawrence, Meigs, Scioto, and Washington counties, OH; and Cabell, Jackson, Mason, Wayne, and Wood counties, WV. **No effect**: in Garrard County, KY; Humphreys County, MS; and Athens, Coshocton, and Morgan counties, OH.	Pipeline corridor presence, vehicle operation, access road culvert replacement, access road maintenance, off-ROW clearing, mechanical repair and fill in ROW, in-stream stabilization, tree clearing, herbicide application, hydrostatic testing, pipeline abandonment, well abandonment, wet ditch crossing activities, access road construction, grading, HDD, hydrostatic testing (withdrawal and discharge), re-grading, fertilizer application, erosion control devices, herbaceous and woody vegetation clearing, stream bank contouring, installation and removal of stream crossing structures, trenching related impacts, waste pits, minor spill events (major spill events are addressed outside the context of the MSHCP), in-stream stabilization, and vegetation disposal	Sedimentation, chemical contaminants, increased water temperature, crushing, substrate compaction, altered flow, burying substrate, entrapment, water level reduction, and introduction of invasive species	**Mandatory**: A2, B2, C1, D1, D2, D3, D5, D6, E2, H1, H2, H3, H4, H5, H6, I1, I2, I3, I4, K1 **Non-Mandatory**: D4, E1, G1, J1	See Table 4.3-4
Insects	American burying beetle *Nicophorus americanus*	Endangered	**Impacts likely** in Athens, Morgan, and Perry counties, OH. **No effect** in Lafayette County, MS; and Gloucester County, NJ; and Hocking and Vinton counties, OH.	Off ROW clearing including tree clearing, shrub clearing, herbaceous vegetation clearing, grading, temporary access roads, and permanent access roads	Habitat degradation, chemical contaminants, reduction in carrion prey base, and increased interspecific competition	**Mandatory**: A1, B2 **Non-Mandatory**: A2, B1	Within first 3 years of HCP implementation: Captive propagation and release, monitoring of release and its success, follow up surveys the next spring.

[1]See Appendix E for county-specific listings
[2]See Appendix E for species specific details regarding AMMs
[3]See Appendix E for species specific details regarding Mitigation

As identified in **Table 4.3-3** above, **Table 4.3-4** provides a summary of mitigation strategies for take associated with mussel species (Clubshell mussel, Fanshell mussel, James spinymussel, Northern riffleshell mussel, and Sheepnose mussel).

Table 4.3-4: Compensatory Mitigation Measures for Mussels – HCP Species (Table 4.3.3)

Number	Compensatory Mitigation Measures for Mussels
Restoration for Direct Take	
A1	Further enhance stream bed following restoration and restore riparian area within its ROW
Mitigation for Aggregate Take	
B1	Protection and restoration of riparian buffers within specific watersheds
Mitigation for New Construction Take	
C1	Protect and restore riparian buffers adjacent to occupied habitat for stable/recruiting populations
C2	Find, relocate and monitor all mussel species and restore habitat at relocation site
Potential Future Mitigation Options	
D1	Identify augmentation, expansion, or reintroduction streams and conserve, restore, and enhance habitat for augmentation, expansion, or reintroduction.
D2	Develop genetic information for conservation of species
D3	Propagate species
D4	Augment/reintroduce species

Non-HCP Species Assessments

As discussed in Chapter 3, 44 Non-HCP Species have the potential to exist in the NCL area, and as such, must be analyzed for potential impacts. In order to assess potential impacts, species were evaluated to identify potential locations within the NCL area, potential activities that could cause impacts, resulting impacts that could threaten or cause take to a species, and required management options and potential BMPs that could be utilized to minimize impacts. **Table 4.3-5** along with the associated tables that outline species-specific BMPs (**Tables 4.3-6** through **4.3-16**) summarize the findings of this assessment.

The species-specific BMP tables largely made use of the AMMs outlined for the HCP Species, however, in some circumstances, additional BMPs have been suggested based on research identified in species' recovery plans and management plans aimed at further minimizing, or in some cases, avoiding impacts. Refer to **Appendix F** for all species-specific impact tables, which includes specific breakdowns by sub-activity for impacts, stressors, range of responses, management options (mandatory and non-mandatory), and likely impacts.

Table 4.3-5: Impacts to Non-HCP Species

Group	Common / Scientific Name	Federal Status	Locations within NCL	Covered Activities Causing Impacts[1]	Impacts Due to Covered Activities[1]	Management Options/BMPs[2]
Mussels	Dwarf wedgemussel *Alasmidonta heterodon*	Endangered	**May be affected** in Morris County, NJ; Delaware, Orange, Sullivan, and Warren counties, NY; Pike County, PA; and Chesterfield, Culpeper, Dinwiddie, Fauquier, Greensville, Hanover, Louisa, Prince William, and Sussex counties, VA; and in its **historic range** in Morris County, NJ; and Chesterfield County, VA.	Construction, operation, and maintenance of, ROWs, access roads, and storage wells, pipeline construction and removal, hydrostatic testing, vehicle operation and foot traffic, stream crossings, and vegetation management and clearing.	Entrapment, introduction of invasive species, crushing, sedimentation, chemical contaminants, permanent or temporary loss of occupied habitat, habitat degradation, physical impacts to individuals, loss of host fish, loss and degradation of host fish habitat, increase in water temperatures, altered flow.	**Mandatory**: 2 **Non-Mandatory**:1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12,13, 14, 15, 16, 17, 18, 19, 20
	Fat pocketbook *Potamilis capax*	Endangered	**May be affected** in East Carroll Parish, LA; and Issaquena, Sharkey, and Washington counties, MS.	Construction, operation, and maintenance of ROWs, access roads, and storage wells, pipeline construction and removal, hydrostatic testing, vehicle operation and foot traffic, stream crossings, and vegetation management and clearing.	Entrapment, introduction of invasive species, crushing, sedimentation, chemical contaminants, permanent or temporary loss of occupied habitat, habitat degradation, physical impacts to individuals, loss of host fish, loss and degradation of host fish habitat, increase in water temperatures, altered flow.	**Mandatory**: 2 **Non-Mandatory**:1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12,13, 14, 15, 16, 17, 18, 19, 20
	Fluted kidney shell pearlymussel *Ptychobranchus subtentum*	Candidate	**May be affected** in Jackson County, KY.	Construction, operation, and maintenance of ROWs, access roads, and storage wells, pipeline construction and removal, hydrostatic testing, vehicle operation and foot traffic, stream crossings, and vegetation management and clearing.	Entrapment, introduction of invasive species, crushing, sedimentation, chemical contaminants, permanent or temporary loss of occupied habitat, habitat degradation, physical impacts to individuals, loss of host fish, loss and degradation of host fish habitat, increase in water temperatures, altered flow.	**Mandatory**: 2 **Non-Mandatory**:1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12,13, 14, 15, 16, 17, 18, 19, 20

Group	Common / Scientific Name	Federal Status	Locations within NCL	Covered Activities Causing Impacts[1]	Impacts Due to Covered Activities[1]	Management Options/BMPs[2]
Mussels	Orangefoot pimpleback pearlymussel *Plethobasus cooperianus*	Endangered	**May be affected** in Bracken, Lewis, and Pendleton counties, KY; and Hardin and Maury counties, TN.	Construction, operation, and maintenance of ROWs, access roads, and storage wells, pipeline construction and removal, hydrostatic testing, vehicle operation and foot traffic, stream crossings, and vegetation management and clearing.	Entrapment, introduction of invasive species, crushing, sedimentation, chemical contaminants, permanent or temporary loss of occupied habitat, habitat degradation, physical impacts to individuals, loss of host fish, loss and degradation of host fish habitat, increase in water temperatures, altered flow.	**Mandatory**: 2 **Non-Mandatory**:1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12,13, 14, 15, 16, 17, 18, 19, 20
	Pink mucket pearlymussel *Lampsilis abrupta*	Endangered	**May be affected** in Bath, Pendleton, and Rowan counties, KY; Gallia, Lawrence, Meigs, Morgan, and Washington counties, OH; Hardin and Trousdale counties, TN; and Clay, Jackson, Kanawha and Mason counties, WV.	Construction, operation, and maintenance of ROWs, access roads, and storage wells, pipeline construction and removal, hydrostatic testing, vehicle operation and foot traffic, stream crossings, and vegetation management and clearing.	Entrapment, introduction of invasive species, crushing, sedimentation, chemical contaminants, permanent or temporary loss of occupied habitat, habitat degradation, physical impacts to individuals, loss of host fish, loss and degradation of host fish habitat, increase in water temperatures, altered flow.	**Mandatory**: 2 **Non-Mandatory**:1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12,13, 14, 15, 16, 17, 18, 19, 20
Mussels	Rabbitsfoot mussel *Quadrula cylindrica*	Candidate	**May be affected** in DeKalb County, IN; Adair, Allen, Barren, Campbell, Floyd, Greenup, Jackson, Lewis, Monroe, Owsley, and Pendleton counties, KY; Sunflower County, MS; Adams, Ashland, Coshocton, Defiance, Delaware, Fairfield, Franklin, Knox, Madison, Muskingum, Pickaway, Putnam, and Union counties, OH; Allegheny, Armstrong, Beaver, Fayette, Greene, Lawrence, Washington, and Westmoreland counties, PA; and Hardin and Maury Counties, TN.	Construction, operation, and maintenance of ROWs, access roads, and storage wells, pipeline construction and removal, hydrostatic testing, vehicle operation and foot traffic, stream crossings, and vegetation management and clearing.	Entrapment, introduction of invasive species, crushing, sedimentation, chemical contaminants, permanent or temporary loss of occupied habitat, habitat degradation, physical impacts to individuals, loss of host fish, loss and degradation of host fish habitat, increase in water temperatures, altered flow.	**Mandatory**: 2 **Non-Mandatory**:1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12,13, 14, 15, 16, 17, 18, 19, 20

Group	Common / Scientific Name	Federal Status	Locations within NCL	Covered Activities Causing Impacts[1]	Impacts Due to Covered Activities[1]	Management Options/BMPs[2]
	Rayed bean mussel *Villosa fabalis*	Candidate	**May be affected** in Dekalb and Marshall counties, IN; Brown, Champaign, Clermont, Coshocton, Defiance, Delaware, Franklin, Hancock, Hardin, Lucas, Madison, Marion, Morrow, Pickaway, Scioto, Union, Warren, and Wyandot counties, OH; and Armstrong, Clarian and Mercer counties, PA.	Construction, operation, and maintenance of ROWs, access roads, and storage wells, pipeline construction and removal, hydrostatic testing, vehicle operation and foot traffic, stream crossings, and vegetation management and clearing.	Entrapment, introduction of invasive species, crushing, sedimentation, chemical contaminants, permanent or temporary loss of occupied habitat, habitat degradation, physical impacts to individuals, loss of host fish, loss and degradation of host fish habitat, increase in water temperatures, altered flow.	**Mandatory**: 2 **Non-Mandatory**:1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12,13, 14, 15, 16, 17, 18, 19, 20
Mussels	Ring pink mussel *Obovaria retusa*	Endangered; XN	**May be affected** in Bracken, Greenup, Lewis, and Pendleton counties, KY.	Construction, operation, and maintenance of ROWs, access roads, and storage wells, pipeline construction and removal, hydrostatic testing, vehicle operation and foot traffic, stream crossings, and vegetation management and clearing.	Entrapment, introduction of invasive species, crushing, sedimentation, chemical contaminants, permanent or temporary loss of occupied habitat, habitat degradation, physical impacts to individuals, loss of host fish, loss and degradation of host fish habitat, increase in water temperatures, altered flow.	**Mandatory**: 2 **Non-Mandatory**:1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12,13, 14, 15, 16, 17, 18, 19, 20
	Rough pigtoe mussel *Pleurobema plenum*	Endangered	**May be affected** in Bracken, Lewis, and Pendleton counties, KY; and Hardin and Trousdale counties, TN.	Construction, operation, and maintenance of ROWs, access roads, and storage wells, pipeline construction and removal, hydrostatic testing, vehicle operation and foot traffic, stream crossings, and vegetation management and clearing.	Entrapment, introduction of invasive species, crushing, sedimentation, chemical contaminants, permanent or temporary loss of occupied habitat, habitat degradation, physical impacts to individuals, loss of host fish, loss and degradation of host fish habitat, increase in water temperatures, altered flow.	**Mandatory**: 2 **Non-Mandatory**:1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12,13, 14, 15, 16, 17, 18, 19, 20

Group	Common / Scientific Name	Federal Status	Locations within NCL	Covered Activities Causing Impacts[1]	Impacts Due to Covered Activities[1]	Management Options/BMPs[2]
	Slabside pearlymussel *Lexingtonia dolabelloides*	Candidate	**May be affected** in Maury County, TN.	Construction, operation, and maintenance of ROWs, access roads, and storage wells, pipeline construction and removal, hydrostatic testing, vehicle operation and foot traffic, stream crossings, and vegetation management and clearing.	Entrapment, introduction of invasive species, crushing, sedimentation, chemical contaminants, permanent or temporary loss of occupied habitat, habitat degradation, physical impacts to individuals, loss of host fish, loss and degradation of host fish habitat, increase in water temperatures, altered flow.	**Mandatory**: 2 **Non-Mandatory**:1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12,13, 14, 15, 16, 17, 18, 19, 20
Mussels	Spectaclecase mussel *Cumberlandia monodonta*	Candidate	**May be affected** in Hardin County, TN.	Construction, operation, and maintenance of ROWs, access roads, and storage wells, pipeline construction and removal, hydrostatic testing, vehicle operation and foot traffic, stream crossings, and vegetation management and clearing.	Entrapment, introduction of invasive species, crushing, sedimentation, chemical contaminants, permanent or temporary loss of occupied habitat, habitat degradation, physical impacts to individuals, loss of host fish, loss and degradation of host fish habitat, increase in water temperatures, altered flow.	**Mandatory**: 2 **Non-Mandatory**:1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12,13, 14, 15, 16, 17, 18, 19, 20
Transitional Successive Pants	American chaffseed *Schwalbea americana*	Endangered	**May be affected** in its **historic range** in Greensville and Sussex counties, VA.	Vegetation management and clearing, ROW repair and construction, pipeline construction and removal, storage wells, vehicle operation and foot traffic, access road construction, and wetland, or other water body crossings.	Removal, crushing, burying, soil compaction, sedimentation, introduction of invasive species, collection, cutting, burning, chemical contaminants, water drawdown, flooding.	**Mandatory**: 2 **Non-Mandatory**: 1,3, 4, 5, 6, 7, 8, 9, 10, 11, 12,13, 14
Transitional Successive Pants	Eastern prairie fringed orchid *Plateurothera leucophaea*	Threatened	**May be affected** in Elkhart, Lake, LaPorte, Noble and St. Joseph counties, IN; Clark, Holmes, Lucas, Ottawa, Sandusky, and Wayne counties, OH; and Augusta County, VA.	Vegetation management and clearing, ROW repair and construction, pipeline construction and removal, storage wells, vehicle operation and foot traffic, access road construction, and wetland, or other water body crossings.	Removal, crushing, burying, soil compaction, sedimentation, introduction of invasive species, collection, cutting, burning, chemical contaminants, water drawdown, flooding.	**Mandatory**: 2 **Non-Mandatory**: 1,3, 4, 5, 6, 7, 8, 9, 10, 11, 12,13, 14

Group	Common / Scientific Name	Federal Status	Locations within NCL	Covered Activities Causing Impacts[1]	Impacts Due to Covered Activities[1]	Management Options/BMPs[2]
Upland Plants	Globe (Shortt's) bladderpod *Lesquerella globosa*	Candidate	**May be affected** in Bourbon, Fayette, and Madison counties, KY; and Davidson and Trousdale counties, TN; and in its **historic range** in Clark, Garrard, and Powell counties, KY; and Maury County, TN.	ROW repair and construction, herbicide application, off-ROW clearing, pipeline construction and removal, tree and shrub removal, storage wells construction and maintenance, vehicle operation and foot traffic, access road construction, and construction staging at stream, wetland, or other water body crossings.	Burying, soil compaction, chemical contaminants, introduction of invasives in occupied habitat, habitat alteration, increased competition with nonnative species, introduction of invasive species by equipment, cutting and crushing of individuals, flooding.	**Mandatory**: 2 **Non-Mandatory**: 1,3, 4
Riparian Plants	Harperella *Ptilimnium nodosum*	Endangered	**May be affected** in Allegany and Washington counties, MD.	Vegetation management and clearing, ROW repair and construction, pipeline construction and removal, storage wells, vehicle operation and foot traffic, access road construction, and stream crossings.	Chemical contaminants, soil compaction, soil disturbance, introduction of invasive species, habitat alteration, sedimentation, altered flow, cutting, crushing and burying of individuals.	**Mandatory**: 2 **Non-Mandatory**:1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12,13, 14, 15, 16, 17, 18
Upland Plants	Lakeside daisy *Hymenoxys herbacea*	Threatened	**May be affected** in Erie and Ottawa Counties, OH.	ROW repair and construction, herbicide application, off-ROW clearing, pipeline construction and removal, tree and shrub removal, storage wells construction and maintenance, vehicle operation and foot traffic, access road construction, and construction staging at stream, wetland, or other water body crossings.	Burying, soil compaction, chemical contaminants, introduction of invasives in occupied habitat, habitat alteration, increased competition with nonnative species, cutting and crushing of individuals.	**Mandatory**: 2 **Non-Mandatory**: 1,3, 4

Group	Common / Scientific Name	Federal Status	Locations within NCL	Covered Activities Causing Impacts[1]	Impacts Due to Covered Activities[1]	Management Options/BMPs[2]
Transitional Successive Plants	Leafy-prairie clover *Dalea foliosa*	Endangered	**May be affected** in Davidson, Maury, Williamson, and Wilson counties, TN; and in its **historic range** in Sumner County, TN.	Vegetation management and clearing, ROW repair and construction, pipeline construction and removal, storage wells, vehicle operation and foot traffic, access road construction, and wetland, or other water body crossings.	Removal, crushing, burying, soil compaction, sedimentation, introduction of invasive species, collection, cutting, burning, chemical contaminants, water drawdown, flooding.	**Mandatory**: 2 **Non-Mandatory**: 1,3, 4, 5, 6, 7, 8, 9, 10, 11, 12,13, 14
Upland Plants	Leedy's roseroot *Sedum integrifolium spp. leedyi or Rhodiola integrifolia ssp. leedyi*	Threatened	**May be affected** in Schuyler and Yates Counties, NY.	ROW repair and construction, herbicide application, off-ROW clearing, pipeline construction and removal, tree and shrub removal, storage wells construction and maintenance, vehicle operation and foot traffic, access road construction, and construction staging at stream, wetland, or other water body crossings.	Burying, soil compaction, chemical contaminants, introduction of invasives in occupied habitat, habitat alteration, increased competition with nonnative species, introduction of invasive species by equipment, cutting and crushing of individuals.	**Mandatory**: 2 **Non-Mandatory**: 1,3, 4
Upland Successional Plants	Michaux's sumac *Rhus michauxii*	Endangered	**May be affected** in Dinwiddie County, VA.	ROW repair and construction, herbicide application, off-ROW clearing, pipeline construction and removal, storage wells construction and maintenance, vehicle operation and foot traffic, access road construction, and construction staging at stream, wetland, or other water body crossings.	Crushing, burying, soil compaction, top soil removal, introduction of invasive species by equipment, chemical contaminants, flooding, chopping, collection of individuals.	**Mandatory**: 2 **Non-Mandatory**: 1, 3, 4, 5, 6

Group	Common / Scientific Name	Federal Status	Locations within NCL	Covered Activities Causing Impacts[1]	Impacts Due to Covered Activities[1]	Management Options/BMPs[2]
Wetland Plants	Northeastern bulrush *Scirpus ancistrochaetus*	Endangered	**May be affected** in Washington County, MD; Adams, Bedford, Cambria, Centre, Clinton, Cumberland, Franklin, Fulton, Lehigh, Monroe, and Northampton counties, PA; Alleghany, Augusta, and Rockingham counties, VA; and Hardy County, WV.	Vegetation management and clearing ROW repair and construction, pipeline construction and removal, storage wells, vehicle operation and foot traffic, access road construction, and stream crossings.	Cushing, removal, soil compaction, topsoil removal and ground disturbance, sedimentation, chemical contaminants, habitat alteration, cutting, introduction of invasive species.	**Mandatory**: 2 **Non-Mandatory**: 1,3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
Upland Plants	Northern monkshood *Aconitum noveboracense*	Threatened	**May be affected** in Delaware and Sullivan counties, NY; and Hocking County, OH.	ROW repair and construction, herbicide application, off-ROW clearing, pipeline construction and removal, tree and shrub removal, storage wells construction and maintenance, vehicle operation and foot traffic, access road construction, and construction staging at stream, wetland, or other water body crossings.	Burying, soil compaction, chemical contaminants, introduction of invasives in occupied habitat, habitat alteration, increased competition with nonnative species, , cutting and crushing of individuals.	**Mandatory**: 2 **Non-Mandatory**: 1,3, 4
Upland Successional Plants	Peter's Mountain mallow *Iliamna corei*	Endangered	**May be affected** in Giles County, VA.	ROW repair and construction, herbicide application, off-ROW clearing, pipeline construction and removal, storage wells construction and maintenance, vehicle operation and foot traffic, access road construction, and construction staging at stream, wetland, or other water body crossings.	Crushing, burying, soil compaction, top soil removal, introduction of invasive species by equipment, chemical contaminants, flooding, chopping, collection of individuals.	**Mandatory**: 2 **Non-Mandatory**: 1, 3, 4, 5, 6

Group	Common / Scientific Name	Federal Status	Locations within NCL	Covered Activities Causing Impacts[1]	Impacts Due to Covered Activities[1]	Management Options/BMPs[2]
Wetland Plants	Pondberry *Lindera melissifolia*	Endangered	**May be affected** in Sharkey and Sunflower counties, MS.	Vegetation management and clearing ROW repair and construction, pipeline construction and removal, storage wells, vehicle operation and foot traffic, access road construction, and stream crossings.	Cushing, removal, soil compaction, topsoil removal and ground disturbance, sedimentation, chemical contaminants, habitat alteration, cutting, introduction of invasive species.	**Mandatory**: 2 **Non-Mandatory**: 1,3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
Transitional Successive Plants	Price's potato bean *Apios priceana*	Endangered	**May be affected** in Maury, Wayne, and Williamson counties, TN; and in its **historic range** in Davidson County, TN.	Vegetation management and clearing, ROW repair and construction, pipeline construction and removal, storage wells, vehicle operation and foot traffic, access road construction, and stream, wetland, or other water body crossings.	Removal, crushing, burying, soil compaction, sedimentation, introduction of invasive species, collection, cutting, burning, chemical contaminants, water drawdown, flooding.	**Mandatory**: 2 **Non-Mandatory**: 1,3, 4, 5, 6, 7, 8, 9, 10, 11, 12,13, 14
Transitional Successive Plants	Running buffalo clover *Trifolium stoloniferum*	Endangered	**May be affected** in Bourbon, Campbell, Clark, Fayette, Madison, and Montgomery counties, KY; Brown, Clermont, and Lawrence counties, OH; and Pendleton, Pocahontas, Preston, Randolph, Tucker, and Webster counties; WV; and in its **historic range** in Jackson County, KY; and Monongalia County, WV.	Vegetation management and clearing, ROW repair and construction, pipeline construction and removal, storage wells, vehicle operation and foot traffic, access road construction, and stream, wetland, or other water body crossings.	Removal, crushing, burying, soil compaction, sedimentation, introduction of invasive species, collection, cutting, burning, chemical contaminants, water drawdown, flooding.	**Mandatory**: 2 **Non-Mandatory**: 1,3, 4, 5, 6, 7, 8, 9, 10, 11, 12,13, 14
Riparian Plants	Sensitive joint-vetch *Aeschynomene virginica*	Threatened	**May be affected** in Chesterfield, Henrico, and James City counties, VA; and in its **historic range** in Gloucester and Salem counties, NJ; Delaware County, PA; and Prince George and Surry Counties, VA.	Vegetation management and clearing, ROW repair and construction, pipeline construction and removal, storage wells, vehicle operation and foot traffic, access road construction, and stream crossings.	Chemical contaminants, soil compaction, soil disturbance, introduction of invasive species, habitat alteration, sedimentation, altered flow, cutting, crushing and burying of individuals.	**Mandatory**: 2 **Non-Mandatory**:1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12,13, 14, 15, 16, 17, 18

Group	Common / Scientific Name	Federal Status	Locations within NCL	Covered Activities Causing Impacts[1]	Impacts Due to Covered Activities[1]	Management Options/BMPs[2]
Upland Successional Plants	Shale barren rockcress *Arabis serotina*	Endangered	**May be affected** in Alleghany, Augusta, Page, and Rockbridge counties, VA; and Greenbrier, Hardy, and Pendleton counties, WV.	ROW repair and construction, herbicide application, off-ROW clearing, pipeline construction and removal, storage wells construction and maintenance, vehicle operation and foot traffic, access road construction, and construction staging.	Crushing, burying, soil compaction, top soil removal, introduction of invasive species by equipment, chemical contaminants, flooding, chopping, collection of individuals.	**Mandatory**: 2 **Non-Mandatory**: 1, 3, 4, 5, 6
Upland Successional Plants	Short's goldenrod *Solidago shortii*	Endangered	**May be affected** in Nicholas and Robertson Counties, KY.	ROW repair and construction, herbicide application, off-ROW clearing, pipeline construction and removal, storage wells construction and maintenance, vehicle operation and foot traffic, access road construction, and construction staging.	Crushing, burying, soil compaction, top soil removal, introduction of invasive species by equipment, chemical contaminants, flooding, chopping, collection of individuals.	**Mandatory**: 2 **Non-Mandatory**: 1, 3, 4, 5, 6
Upland Successional Plants	Small-whorled pogonia *Isotria medeoloides*	Threatened	**May be affected** in New Castle County, DE; Hocking and Scioto counties, OH; Centre and Chester counties, PA; and Fairfax, James City, Madison, and Prince William counties, VA; and in its **historic range** in Montgomery County, MD; Hunterdon County, NJ; Rockland County, NY; Greene, Monroe, and Montgomery counties, PA; and Greenbrier County, WV.	ROW repair and construction, herbicide application, off-ROW clearing, pipeline construction and removal, storage wells construction and maintenance, vehicle operation and foot traffic, access road construction, and construction staging at stream, wetland, or other water body crossings.	Crushing, burying, soil compaction, top soil removal, introduction of invasive species by equipment, chemical contaminants, flooding, chopping, collection of individuals.	**Mandatory**: 2 **Non-Mandatory**: 1, 3, 4, 5, 6

Group	Common / Scientific Name	Federal Status	Locations within NCL	Covered Activities Causing Impacts[1]	Impacts Due to Covered Activities[1]	Management Options/BMPs[2]
Upland Successional Plants	Smooth coneflower *Echinacea laevigata*	Endangered	**May be affected** in Allegheny and Botetourt counties, VA; and in its **historic range** in Lancaster County, PA.	ROW repair and construction, herbicide application, off-ROW clearing, pipeline construction and removal, storage wells construction and maintenance, vehicle operation and foot traffic, access road construction, and construction staging at stream, wetland, or other water body crossings.	Crushing, burying, soil compaction, top soil removal, introduction of invasive species by equipment, chemical contaminants, flooding, chopping, collection of individuals.	**Mandatory**: 2 **Non-Mandatory**: 1, 3, 4, 5, 6
Riparian Plants	Spring creek bladderpod *Lesquerella perforata*	Endangered	**May be affected** in Wilson County, TN.	Vegetation management and clearing, ROW repair and construction, pipeline construction and removal, storage wells, vehicle operation and foot traffic, access road construction, and stream crossings.	Chemical contaminants, soil compaction, soil disturbance, introduction of invasive species, habitat alteration, sedimentation, altered flow, cutting, crushing and burying of individuals.	**Mandatory**: 2 **Non-Mandatory**:1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12,13, 14, 15, 16, 17, 18
Wetland Plants	Swamp pink *Helonias bullata*	Threatened	**May be affected** in New Castle County, DE; Cecil County, MD; Gloucester, Morris, and Salem counties, NJ; and Augusta and Henrico counties, VA.	Vegetation management and clearing ROW repair and construction, pipeline construction and removal, storage wells, vehicle operation and foot traffic, access road construction, and stream crossings.	Cushing, removal, soil compaction, topsoil removal and ground disturbance, sedimentation, chemical contaminants, habitat alteration, cutting, introduction of invasive species.	**Mandatory**: 2 **Non-Mandatory**: 1,3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
Upland Successional Plants	Tennessee purple coneflower *Echinacea tennesseensis*	Endangered	**May be affected** in Davidson and Wilson counties, TN.	ROW repair and construction, herbicide application, off-ROW clearing, pipeline construction and removal, storage wells construction and maintenance, vehicle operation and foot traffic, access road construction, and construction staging at stream, wetland, or other water body crossings.	Crushing, burying, soil compaction, top soil removal, introduction of invasive species by equipment, chemical contaminants, flooding, chopping, collection.	**Mandatory**: 2 **Non-Mandatory**: 1, 3, 4, 5, 6

Group	Common / Scientific Name	Federal Status	Locations within NCL	Covered Activities Causing Impacts[1]	Impacts Due to Covered Activities[1]	Management Options/BMPs[2]
Wetland plants	Virginia sneezeweed *Helenium virginicum*	Threatened	**May be affected** in Augusta and Rockingham counties, VA.	Vegetation management and clearing ROW repair and construction, pipeline construction and removal, storage wells, vehicle operation and foot traffic, access road construction, and stream crossings	Cushing, removal, soil compaction, topsoil removal and ground disturbance, sedimentation, chemical contaminants, habitat alteration, cutting, introduction of invasive species	**Mandatory**: 2 **Non-Mandatory**: 1,3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
Riparian Plants	Virginia spirea *Spiraea virginiana*	Threatened	**May be affected** in Lewis County, KY; Sioto County, OH; and Greenbrier, Mercer, Raleigh, Summers, and Upshur counties; and in its **historic range** in Fayette County, PA.	Vegetation management and clearing, ROW repair and construction, pipeline construction and removal, storage wells, vehicle operation and foot traffic, access road construction, and stream crossings.	Chemical contaminants, soil compaction, soil disturbance, introduction of invasive species, habitat alteration, sedimentation, altered flow, cutting, crushing and burying of individuals.	**Mandatory**: 2 **Non-Mandatory**:1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12,13, 14, 15, 16, 17, 18
Upland Plants	White-haired goldenrod *Solidago albopilosa*	Threatened	**May be affected** in Menifee and Powell Counties, KY.	ROW repair and construction, herbicide application, off-ROW clearing, pipeline construction and removal, tree and shrub removal, storage wells construction and maintenance, vehicle operation and foot traffic, access road construction, and construction staging at stream, wetland, or other water body crossings.	Burying, soil compaction, chemical contaminants, introduction of invasives in occupied habitat, habitat alteration, increased competition with nonnative species, introduction of invasive species by equipment, cutting and crushing of individuals.	**Mandatory**: 2 **Non-Mandatory**: 1,3, 4

Group	Common / Scientific Name	Federal Status	Locations within NCL	Covered Activities Causing Impacts[1]	Impacts Due to Covered Activities[1]	Management Options/BMPs[2]
Birds	Piping plover *Charadrius melodus*	Endangered	**May be affected** in Cameron, Lafourche, Plaquemines, St. Mary, Terrebonne, and Vermilion parishes, LA.	Construction, O&M of facilities, ROW repair and construction, herbicide application, off-ROW clearing, pipeline construction and removal, storage wells construction and O&M, vehicle operation and foot traffic, access road construction, construction staging at stream, wetland, or other water body crossings, vegetation management and clearing.	Habitat degradation, potential attraction of predators, increased disturbance stress on individuals, potential for contaminant impacts.	**Mandatory**: 2 **Non-Mandatory**: 1
	Red-cockaded woodpecker *Picoidees borealis*	Endangered	**May be affected** in Calcasieu, Evangeline, Grant, La Salle, and Rapides parishes, LA; and Lafayette County, MS; and in its **historic range** in Powell County, KY; Catahoula Parish, LA; Northampton County, NC; Hardin and McNairy counties, TN; and Southampton and Sussex counties, VA.	Construction, O&M of facilities ROW repair and construction, herbicide application, off-ROW clearing, pipeline construction and removal, storage wells construction and maintenance, vehicle operation and foot traffic, access road construction, , and vegetation management and clearing.	Habitat degradation, increased disturbance stress on individuals and nesting pairs, reduction in prey abundance, noise disturbance on individuals, potential for chemical contaminants, habitat degradation from chemical contaminants.	**Mandatory**: 2 **Non-Mandatory**:1, 3, 4
Fish	Diamond Darter *Crystallaria cincotta*	Candidate	**May be affected** in Kanawha and Clay Counties, WV.	Construction, operation, and maintenance of facilities, ROWs, access roads, and storage wells, pipeline construction and removal, vehicle operation and foot traffic, stream crossings, and vegetation management and clearing.	Permanent or temporary loss of habitat, habitat degradation, water quality impacts, physical impacts to individuals, reduction of prey population diversity and abundance.	**Mandatory**: 2 **Non-Mandatory**:1, 3, 4, 5, 6, 7, 8, 9, 10, 12,13, 14, 15, 16, 17, 18, 19, 20

Group	Common / Scientific Name	Federal Status	Locations within NCL	Covered Activities Causing Impacts[1]	Impacts Due to Covered Activities[1]	Management Options/BMPs[2]
	Pallid sturgeon *Scaphirhynchus albus*	Endangered	**May be affected** in East Carroll, Madison, Rapides, and St. Mary parishes, LA; and Issaquena, Sharkey, Warren, and Washington counties, MS.	Construction, operation, and maintenance of facilities, ROWs, access roads, and storage wells, pipeline construction and removal, vehicle operation and foot traffic, stream crossings, and vegetation management and clearing.	Temporary loss of occupied habitat, physical impacts to individuals, habitat degradation and water quality degradation, stress on individuals, contaminant impacts, stress on eggs.	**Mandatory**: 2 **Non-Mandatory**:1, 3, 4, 5, 6, 7, 8, 9, 10, 12,13, 14, 15, 16, 17, 18, 19
	Roanoke logperch *Percina rex*	Endangered	**May be affected** in Brunswick, Dinwiddie, Greensville, Mecklenburg, Southampton, and Sussex counties, VA.	Construction, operation, and maintenance of facilities, ROWs, access roads, and storage wells, pipeline construction and removal, vehicle operation and foot traffic, stream crossings, and vegetation management and clearing.	Temporary or permanent loss of occupied habitat, physical impacts to individuals, habitat degradation and water quality degradation, reduction of prey population, stress on individuals, stress on eggs.	**Mandatory**: 2 **Non-Mandatory**:1, 3, 4, 5, 6, 7, 8, 9, 10, 12,13, 14, 15, 16, 17, 18, 19
	Spotfin chub *Erimonax monachus*	Threatened, XN	**May be affected** in Lewis County, TN.	Construction, operation, and maintenance of facilities, ROWs, access roads, and storage wells, pipeline construction and removal, vehicle operation and foot traffic, stream crossings, and vegetation management and clearing.	Permanent or temporary loss of occupied habitat, water quality impacts, habitat degradation, physical impacts to individuals, reduction of prey population diversity and abundance.	**Mandatory**: 2 **Non-Mandatory**:1, 3, 4, 5, 6, 7, 8, 9, 10, 12,13, 14, 15, 16, 17, 18, 19, 20
Fish	Pygmy madtom *Noturus stanauli*	Endangered, XN	**May be affected** in Maury County, TN.	Construction, operation, and maintenance of facilities, ROWs, access roads, and storage wells, pipeline construction and removal, vehicle operation and foot traffic, stream crossings, and vegetation management and clearing.	Temporary or permanent loss of occupied habitat, physical impacts to individuals, habitat degradation and water quality degradation, reduction of prey population, stress on individuals, stress on eggs.	**Mandatory**: 2 **Non-Mandatory**:1, 3, 4, 5, 6, 7, 8, 9, 10, 12,13, 14, 15, 16, 17, 18, 19, 20

Group	Common / Scientific Name	Federal Status	Locations within NCL	Covered Activities Causing Impacts[1]	Impacts Due to Covered Activities[1]	Management Options/BMPs[2]
Reptiles	Eastern massasauga *Sistrurus catenatus catenatu*	Candidate	**May be affected** in Elkhart, LaPorte, Marshall, Noble, Porter, and St. Joseph counties, IN; Ashtabula, Champaign, Clark, Clinton, Columbiana, Crawford, Defiance, Erie, Fairfield, Fayette, Greene, Hardin, Huron, Licking, Logan, Lorain, Lucas, Marion, Medina, Montgomery, Ottawa, Paulding, Sandusky, Seneca, Stark, Trumbull, Warren, Wayne, and Wyandot counties OH; and Butler and Mercer counties, PA.	Construction, operation, and maintenance of facilities, ROW repair and construction, herbicide application, off-ROW clearing, pipeline construction and removal, storage wells construction and maintenance, vehicle operation and foot traffic, access road construction and maintenance, and construction staging at wetland crossing construction, and vegetation management and clearing.	Physical impacts to individuals and habitat, chemical contaminants, water-level manipulation, predation, burning, chopping and increase predation potential.	**Mandatory**: 2 **Non-Mandatory**: 1, 3, 4, 5, 6, 7, 8

[1] See individual species tables in Appendix F for specific impacts by sub-activity type
[2] See individual species tables in Appendix F for details regarding management options and BMPs

Table 4.3-6: Wetland Plants Management Options (BMPs)

Number	Wetland Plants Management Options (BMPs)
Northeastern bulrush, Virginia Sneezeweed, Swamp Pink, Pondberry	
Habitat and Occupation Surveys	
1	Survey to determine presence/absence within identified suitable habitat
Prepare an Environmental Management & Construction Plan	
2	Prepare an Environmental Management & Construction Plan
Stream Bed or Wetland Construction Methods	
3	Consider HDD or other trenchless methods for install or replacement across habitat
4	Inspect for and correct bank destabilization associated with the pipeline within occupied habitat
Timing Restrictions	
5	Timing restrictions to minimize impact
Pipeline Abandonment	
6	Pipeline abandonment specifications
Contaminants	
7	Site staging areas location restrictions
8	Ensure that all imported fill material is free from contaminants
9	Use enhanced and redundant spill control for storage well activities in occupied habitat
10	Avoid use of fertilizers or herbicides within a specified distance of occupied habitat
Withdrawal and Discharge of Water	
11	Avoid drawing hydrostatic test water from or discharging directly into known or presumed occupied habitat
12	Use best available water withdrawal/discharge impact avoidance techniques
Travel and Access Roads	
13	Avoid driving across identified habitat
Exotic Species	
14	Thoroughly clean all equipment prior to use to avoid inadvertent introduction of exotics

Table 4.3-7: Riparian Plants Management Options (BMPs)

Number	Riparian Plants Management Options (BMPs)
Harparella, Sensitive Joint Vetch, Spring Creek Bladderpod, Virginia Spiraea	
Habitat and Occupation Surveys	
1	Survey to determine presence/absence within identified suitable habitat
Prepare an Environmental Management & Construction Plan	
2	Prepare an Environmental Management & Construction Plan
Stream Bed or Wetland Construction Methods	
3	Consider HDD or other trenchless methods for install or replacement across habitat
4	Install pipelines to a minimum depth at least 10 feet past the high water line in riparian areas
5	Do not install In-Channel repairs within occupied habitat
6	Inspect for and correct bank destabilization associated with the pipeline within occupied habitat
Stream Bank or Wetland Conservation	
7	Do not construct culverts or stone access roads across water body/riparian occupied habitat
8	Use sufficient half pipes to minimize flow disruption in stream habitat
Timing Restrictions	
9	Timing restrictions to minimize impact
Pipeline Abandonment	
10	Pipeline abandonment specifications

Number	Riparian Plants Management Options (BMPs)
Contaminants	
11	Site staging areas location restrictions
12	Ensure that all imported fill material is free from contaminants
13	Use enhanced and redundant spill control for storage well activities in occupied habitat
14	Avoid use of fertilizers or herbicides within a specified distance of occupied habitat
Withdrawal and Discharge of Water	
15	Avoid drawing hydrostatic test water from or discharging directly into known or presumed occupied habitat
16	Use best available water withdrawal/discharge impact avoidance techniques
Travel and Access Roads	
17	Avoid driving across identified habitat
Exotic Species	
18	Thoroughly clean all equipment prior to use to avoid inadvertent introduction of exotics; All fill material used in construction or restoration should be certified noxious weed-free

Table 4.3-8: Transitional Successive Plants Management Options (BMPs)

Number	Transitional Successive Plants Management Options (BMPs)
American chaffseed, Eastern Prairie Fringed Orchid, Leafy Prairie Clover, Price's Potato Bean, and Running Buffalo Clover	
Habitat and Occupation Surveys	
1	Survey to determine presence/absence within identified suitable habitat
Prepare an Environmental Management & Construction Plan	
2	Prepare an Environmental Management & Construction Plan
Stream Bed or Wetland Construction Methods	
3	Consider HDD or other trenchless methods for install or replacement across habitat
4	Inspect for and correct bank destabilization associated with the pipeline within occupied habitat
Timing Restrictions	
5	Timing restrictions to minimize impact
Pipeline Abandonment	
6	Pipeline abandonment specifications
Contaminants	
7	Site staging areas location restrictions
8	Ensure that all imported fill material is free from contaminants
9	Use enhanced and redundant spill control for storage well activities in occupied habitat
10	Avoid use of fertilizers or herbicides within a specified distance of occupied habitat
Withdrawal and Discharge of Water	
11	Avoid drawing hydrostatic test water from or discharging directly into known or presumed occupied habitat
12	Use best available water withdrawal/discharge impact avoidance techniques
Travel and Access Roads	
13	Avoid driving across identified habitat
Exotic Species	
14	Thoroughly clean all equipment prior to use to avoid inadvertent introduction of exotics and all fill material used in construction or restoration should be certified noxious weed-free.

Table 4.3-9: Upland Successive Plants Management Options (BMPs)

Number	Upland Successional Plants Management Options (BMPs)
Michaux's sumac, Peters Mountain mallow, Shale barren rock-cress, Short's goldenrod, small whorled pogonia, smooth coneflower, Tennessee purple coneflower	
Habitat and Occupation Surveys	
1	Survey to determine presence/absence within identified suitable habitat
Prepare an Environmental Management & Construction Plan	
2	Prepare an Environmental Management & Construction Plan
Construction	
3	Avoid use of fertilizers or herbicides within a specified distance of occupied habitat
4	Materials and equipment used near areas of occupied habitat should be certified weed-free and cleaned
5	Correctly timed mowing, brush-clearing, tree removal or trimming during the growing season (to avoid direct mortality)
6	Remove temporary access routes created for construction or maintenance activities after work is completed

Table 4.3-10: Upland Plants Management Options (BMPs)

Number	Upland Plants Management Options (BMPs)
Short's bladderpod, lakeside daisy, Leedy's roseroot, northern monkshood, white-haired goldenrod	
Habitat and Occupation Surveys	
1	Survey to determine presence/absence within identified suitable habitat
Prepare an Environmental Management & Construction Plan	
2	Prepare an Environmental Management & Construction Plan
Construction	
3	Avoid use of fertilizers or herbicides within a specified distance of occupied habitat
4	Materials and equipment used near areas of occupied habitat should be certified weed-free and cleaned

Table 4.3-11: Mussels Management Options (BMPs)

Number	Mussels Management Options (BMPs)
Dwarf Wedgemussel, Fat Pocketbook, Fluted Kidneyshell, Orangefoot Pimpleback, Pink Mucket, Rabbitsfoot, Rayed Bean, Ring Pink Mussel, Rough Pigtoe, Slabside Pearlymussel, Spectaclecase	
Habitat and Occupation Surveys	
1	Survey to determine presence/absence within identified suitable habitat
Prepare an Environmental Management & Construction Plan	
2	Prepare an Environmental Management & Construction Plan
Stream Bed Construction Methods	
3	Consider HDD or other trenchless methods for install or replacement across habitat
4	Install pipelines to a minimum depth at least 10 feet past the high water line in riparian areas
5	Do not install In-Channel repairs within occupied habitat
6	Work from a lay barge or temporary work bridge rather than operate heavy equipment in-stream
7	Remove equipment bridges as soon as practicable
8	Inspect for and correct bank destabilization associated with the pipeline within occupied habitat
Stream Bank Conservation	
9	Do not construct culverts or stone access roads across water body/riparian occupied habitat
10	Use sufficient half pipes to minimize flow disruption in stream habitat
Timing Restrictions	

Number	Mussels Management Options (BMPs)
11	Timing restrictions to minimize impact
Pipeline Abandonment	
12	Pipeline abandonment specifications
Contaminants	
13	Site staging areas location restrictions
14	Ensure that all imported fill material is free from contaminants
15	Use enhanced and redundant spill control for storage well activities in occupied habitat
16	Avoid use of fertilizers or herbicides within a specified distance of occupied habitat
Withdrawal and Discharge of Water	
17	Avoid drawing hydrostatic test water from or discharging directly into known or presumed occupied habitat
18	Use best available water withdrawal/discharge impact avoidance techniques
Travel and Access Roads	
19	Avoid driving across identified habitat
Exotic Species	
20	Thoroughly clean all equipment prior to use to avoid inadvertent introduction of exotics

Table 4.3-12: Piping Plover Management Options (BMPs)

Number	Piping Plover Management Options (BMPs)
Habitat and Occupation Surveys	
1	Survey to determine presence/absence within identified suitable habitat
Prepare an Environmental Management & Construction Plan	
2	Prepare an Environmental Management & Construction Plan

Table 4.3-13: Red-Cockaded Woodpecker Management Options (BMPs)

Number	Red-Cockaded Woodpecker Management Options (BMPs)
Habitat and Occupation Surveys	
1	Survey to determine presence/absence within identified suitable habitat
Prepare an Environmental Management & Construction Plan	
2	Prepare an Environmental Management & Construction Plan
Construction	
3	Implement noise impact mitigation measures in and adjacent to designated critical habitat or in known or presumed occupied habitat in accordance with the ECS
4	Begin restoration immediately following construction as conditions allow. Monitoring required for new pipeline construction.
5	Establish a buffer zone from a cavity tree or the center of a group of cavity trees.
6	Designation of foraging habitat

Table 4.3-14: Roanoke Logperch Management Options (BMPs)

Number	Roanoke Logperch Management Options (BMPs)
Habitat and Occupation Surveys	
1	Survey to determine presence/absence within identified suitable habitat
Prepare an Environmental Management & Construction Plan	
2	Prepare an Environmental Management & Construction Plan
Stream Bed Construction Methods	
3	Consider HDD or other trenchless methods for install or replacement across habitat

Number	Roanoke Logperch Management Options (BMPs)
4	Install pipelines to a minimum depth at least 10 feet past the high water line in riparian areas
5	Do not install In-Channel repairs within occupied habitat
6	Work from a lay barge or temporary work bridge rather than operate heavy equipment in-stream
Stream Bed Construction Methods	
7	Remove equipment bridges as soon as practicable
8	Inspect for and correct bank destabilization associated with the pipeline within occupied habitat
Stream Bank Conservation	
9	Do not construct culverts or stone access roads across water body/riparian occupied habitat
10	Use sufficient half pipes to minimize flow disruption in stream habitat
Timing Restrictions	
11	Timing restrictions to minimize impact
Pipeline Abandonment	
12	Pipeline abandonment specifications
Contaminants	
13	Site staging areas location restrictions
14	Ensure that all imported fill material is free from contaminants
15	Use enhanced and redundant spill control for storage well activities in occupied habitat
16	Avoid use of fertilizers or herbicides within a specified distance of occupied habitat
Withdrawal and Discharge of Water	
17	Avoid drawing hydrostatic test water from or discharging directly into known or presumed occupied habitat
18	Use best available water withdrawal/discharge impact avoidance techniques
Travel and Access Roads	
19	Avoid driving across identified habitat

Table 4.3-15: Pallid Sturgeon Management Options (BMPs)

TNumber	Pallid Sturgeon Management Options (BMPs)
Habitat and Occupation Surveys	
1	Survey to determine presence/absence within identified suitable habitat
Prepare an Environmental Management & Construction Plan	
2	Prepare an Environmental Management & Construction Plan
Stream Bed Construction Methods	
3	Consider HDD or other trenchless methods for install or replacement across habitat
4	Install pipelines to a minimum depth at least 10 feet past the high water line in riparian areas
5	Do not install In-Channel repairs within occupied habitat
6	Work from a lay barge or temporary work bridge rather than operate heavy equipment in-stream
7	Remove equipment bridges as soon as practicable
8	Inspect for and correct bank destabilization associated with the pipeline within occupied habitat
Stream Bank Conservation	
9	Do not construct culverts or stone access roads across water body/riparian occupied habitat
10	Use sufficient half pipes to minimize flow disruption in stream habitat
Timing Restrictions	
11	Timing restrictions to minimize impact
Pipeline Abandonment	
12	Pipeline abandonment specifications
Contaminants	
13	Site staging areas location restrictions

TNumber	Pallid Sturgeon Management Options (BMPs)
14	Ensure that all imported fill material is free from contaminants
15	Use enhanced and redundant spill control for storage well activities in occupied habitat
16	Avoid use of fertilizers or herbicides within a specified distance of occupied habitat
17	Prepare a site specific stormwater management plan and Spill Prevention Control and Countermeasures (SPCC) plan
Withdrawal and Discharge of Water	
18	Avoid drawing hydrostatic test water from or discharging directly into known or presumed occupied habitat
19	Use best available water withdrawal/discharge impact avoidance techniques

Table 4.3-16: Diamond Darter, Pygmy Madtom and Spotfin Chub Management Options (BMPs)

Number	Diamond Darter, Pygmy Madtom and Spotfin Chub Management Options (BMPs)
Habitat and Occupation Surveys	
1	Survey to determine presence/absence within identified suitable habitat
Prepare an Environmental Management & Construction Plan	
2	Prepare an Environmental Management & Construction Plan
Stream Bed Construction Methods	
3	Consider HDD or other trenchless methods for install or replacement across habitat
4	Install pipelines to a minimum depth at least 10 feet past the high water line in riparian areas
5	Do not install In-Channel repairs within occupied habitat
6	Work from a lay barge or temporary work bridge rather than operate heavy equipment in-stream
7	Remove equipment bridges as soon as practicable
8	Inspect for and correct bank destabilization associated with the pipeline within occupied habitat
Stream Bank Conservation	
9	Do not construct culverts or stone access roads across water body/riparian occupied habitat
10	Use sufficient half pipes to minimize flow disruption in stream habitat
Timing Restrictions	
11	Timing restrictions to minimize impact
Pipeline Abandonment	
12	Pipeline abandonment specifications
Contaminants	
13	Site staging areas location restrictions
14	Ensure that all imported fill material is free from contaminants
15	Use enhanced and redundant spill control for storage well activities in occupied habitat
16	Avoid use of fertilizers or herbicides within a specified distance of occupied habitat
Withdrawal and Discharge of Water	
17	Avoid drawing hydrostatic test water from or discharging directly into known or presumed occupied habitat
18	Use best available water withdrawal/discharge impact avoidance techniques
Travel and Access Roads	
19	Avoid driving across identified habitat
Exotic Species	
20	Thoroughly clean all equipment prior to use to avoid inadvertent introduction of exotics

Alternative 3 – Issuance of a 10-year ITP and Approval of the NiSource HCP

Potential types of impacts to threatened, endangered, and candidate species under Alternative 3 are identical to those discussed above for Alternative 2 although the duration of the future impacts and level of take anticipated is logically reduced commensurately (generally to 1/5 the level as discussed in the HCP). The potential conservation benefit associated with NiSource's Conservation Program would also be reduced based on the shorter duration of the HCP implementation, particularly the long-term benefits associated with the "front-loading" of the mitigations for all O&M activities within the first seven years of implementation associated with Alternative 2.

4.4 Social Resources

4.4.1 Land Use

Analysis of land use resources includes a discussion related to direct and indirect impacts to land ownership, including federal, state, and local conservation lands, along with land cover types, and rates of land conversion within the NCL area due to the alternatives considered.

Lands within the NCL area include lands under federal, state, local, and private ownership. Each individual parcel has the potential to carry with it certain land use regulations or restrictions that are required regardless of the issuance of an ITP. For instance, each individual Forest within the USFS system has standards and guidelines outlined in respective Forest Plans that establish allowable uses for various management areas, and limit or restrict specific types of uses/activities. In addition, NiSource has existing Special Use Permits on file with the individual Forests for existing ROWs. Each Special Use Permit may also carry with it additional seasonal, temporal, or activity-based restrictions that NiSource must follow in order to conduct its operation, maintenance, and construction activities in an otherwise lawful manner. Other federal agencies and individual state agencies, and potentially locally-held public lands are also likely to have land use restrictions that guide allowable development on these public lands. As such, these restrictions would guide all NiSource activities on those properties regardless of the issuance of the ITP.

Similarly, Counties, NGOs, and local governments often have zoning or other development or deed restrictions on private lands that vary depending upon the current use and location of a particular property. NiSource, as part of its operation, maintenance, and construction activities

is required to conduct activities that are consistent with local land use restrictions and zoning, regardless of the issuance of an ITP.

The No Action Alternative would have no direct or indirect impacts on land use or land ownership given it does not specifically authorize any changes to land use or land regulations. All future NiSource projects would undergo appropriate regulatory review by the appropriate land manager (e.g. USFS, USFWS, USACE). Future land use changes resulting from these reviews are not in the purview of this EIS. However, the No Action Alternative does not include the Mitigation/Conservation program (Alts. 2, 3, 4) or the Migratory Bird Conservation program (Alt. 3). As such, the No Action Alternative would not have the same potential to slow land conversion rates or protect certain land uses into the future within those states included in the NCL area as the action alternatives.

4.4.2 Socioeconomics and Environmental Justice

A summary of socioeconomic and environmental justice conditions is provided in Chapter 3. A discussion of expected direct and indirect impacts related to changes in population, employment, unemployment, personal income, poverty, and local/state employment follows. Additionally, environmental justice, housing, and public services are discussed.

NiSource activities would occur regardless of the issuance of the ITP and implementation of the HCP. No measurable direct or indirect impacts to socio-economic resources would occur due to implementation of any of the alternatives. However, under the No Action Alternative, NiSource would not establish a designated mitigation fund to pay for mitigation/conservation efforts aimed at compensating for species take across the NCL area (Alts. 2, 3, 4) or the Migratory Bird Conservation program (Alt. 3), which could perhaps provide some benefit to local communities through land acquisition and/or conservation. Any compensation required would be calculated and paid for as individual projects are initiated and reviewed by individual USFWS Field Offices, and cannot be quantified at this time.

While there may be some slight variations in specific timing of NiSource activities due to time savings associated with the issuance of the ITP, there would be minimal differences between the type and overall number of operation, maintenance, and or construction activities that NiSource would ultimately pursue over the lifespan of the ITP. As such, no measurable direct or indirect impacts to employment, income, population (including low income/minority populations), housing or public services are expected throughout the NCL area based on issuance of the ITP

and implementation of the HCP via future NiSource projects. Variations in employment and/or goods and services associated with future construction projects as well as any HCP associated mitigation projects may occur but these are expected to be localized and insignificant when compared to the existing conditions in the entire NCL area.

NiSource estimates the average annual costs for implementing the HCP will vary from year to year, and such costs generally fall into five categories. Administrative costs (e.g., program management, training, etc.) are estimated at $140,000 in the first year and $120,000 thereafter over the life of the permit. Mitigation Costs (e.g. for compensatory mitigation) includes O&M mitigation of $784,595 (in 2010 dollars) over the first seven years of the permit, as well as a range of Project-Specific mitigation funding which could range from $0 to $27,848,800 over the life of the permit. HCP compliance costs (e.g., expenses associated with AMMs, surveying, monitoring) would generally be offset by the efficiencies created through the implementation of the HCP itself. Costs associated with adaptive management and changed circumstances were not estimated in the HCP due to the very nature of these subjects; and the financial assurances used to secure funding for both adaptive management and changed circumstances will vary depending upon whether such future changes relate, for example, to mitigation, AMMs or take calculations.

Potential types of impacts relative to socioeconomics under Alternative 4 are identical to those discussed above for Alternative 2 although the duration of any future opportunity to provide local economic benefit through conservation actions would be logically reduced by 4/5th commensurate with permit duration as well as the opportunity to utilize NiSource mitigation funds associated with the “front-loading” of funding for O&M mitigation during the first seven years of the permit, as provided for in the Proposed Action.

4.4.3 Transportation and Utilities

Analysis of transportation and utility resources includes a discussion of direct and indirect impacts related to vehicular, rail, and air travel networks including roads, highways, railroads, and airports within the NCL area due to the alternatives considered. Traffic circulation refers to the movement of vehicles throughout a road or highway network. Utilities include water/sewer lines, electric transmission lines, and telecommunication lines.

With all alternatives, all future NiSource projects would be subject to regulatory and utility approval, including permits for right-of-way encroachment and many would also require

additional state or federal level permits or review. Therefore, any potential site specific impacts on transportation or utilities based on NiSource's future activities would be considered on a project-by-project basis, and the approval of individual projects may be subject to specific mitigation measures.

Conditions of approval within individual transportation-related permits might include notification requirements and traffic control measures during construction. Mitigation related to utilities could potentially include efforts to avoid temporary construction-related disruptions in service, including advance coordination with service providers and scheduling work during low-demand periods. Other examples include communication with utility providers prior to construction to coordinate the relocation of utilities within an alternative right-of-way, if needed. Construction would be scheduled to minimize or avoid potential service interruptions.

The issuance of an ITP as would occur under any of the action alternatives, does not solely authorize projects that would directly affect the capacity of the existing transportation infrastructure or utility systems within the 14-state NCL area.

4.4.4 Cultural Resources

Analysis of cultural resources includes a discussion of potential direct and indirect impacts to a wide range of resources and places having historic, cultural, archaeological, or architectural significance, or places from the past having important public and scientific uses. Cultural resources can be either man-made or natural physical features associated with human activity and are typically unique, fragile, and nonrenewable.

Compliance with Section 106 will occur within the NCL as projects are reviewed for site-specific resource issues. Areas that have been maintained within the pipeline ROW have been reviewed for archeological resource issues over the life of the pipeline operation. As new activities such as expansion projects occur, the areas will be reviewed for compliance with the NHPA. NiSource annual project planning includes consultation with State Historic Preservation Officers for clearance or completion of any required compliance documentation (e.g., Phase I surveys). In the event that a site-specific project requires further planning relative to impacts on historic or cultural resources, NiSource serves as the non-Federal representative to complete those plans. For the Federal agency, and for agencies cooperating on this EIS, future NEPA documentation will include evaluation of any historic or cultural preservation concerns as a result of NiSource planning and providing the information.

From a practical standpoint, the extent to which NiSource is able to document previous NHPA clearance for maintenance activities, such review will be completed. Where new ground disturbance is anticipated, such as looping of the existing pipeline, NiSource must assure that their Federally permitted activities are in full compliance with NHPA and other applicable Federal and state law governing historic and cultural resource preservation. Specific NEPA analysis of historic and cultural resources within the NCL is not completed within this EIS due to the scale of the project and lack of specific information regarding the on-the-ground impacts anticipated over time.

Section 106 and associated state-specific historic regulations are outside of the purview of the Service and the issuance of an ITP. There are no measurable differences between any of the alternatives related to cultural resources, although the potential additional conservation projects associated with Alternatives 2 and 3 would be required to also comply with Cultural and Historic resources requirements.

4.4.5 Recreation

Analysis of recreation resources includes a discussion of potential direct and indirect impacts on the amount and type of land in public ownership (federal, state, local) within the NCL area, as well as recreational uses on federal lands managed by the USFS, NPS, Service, and USACE within the NCL area.

Public lands available for recreation have existing land use restrictions that guide allowable development and uses on these lands. As such, these restrictions would guide all NiSource activities on those properties under all alternatives, and would minimize potential impacts to recreational resources. However, with either of the action alternatives, there would include mitigation/conservation program(s) available to secure additional conservation lands. Conservation lands available for certain types of recreation within those states included in the NCL area may benefit with implementation of one of the action alternatives, due to the potential acquisition and/or protection of conservation lands.

4.4.6 Visual Resources

Analysis of visual resources includes a discussion of potential impacts related to natural or human made features that make up the aesthetic quality of the NCL area. These features may be landforms, water resources, vegetation, or manufactured in form, and make up the overall

visual impression in a certain area. Specific lands or resources that would constitute potentially sensitive visual resources within the NCL area include lands managed by the NPS or USFS, as well as WSRs, NSBs, AARs, and state-designated scenic byways. Other federal lands of note within the NCL area include the Appalachian Trail and the Laurel Forks Wilderness Area within the Monongahela NF in West Virginia.

Implementing any of the alternatives would not specifically authorize projects that would directly affect the quality of visual resources within the NCL area. As specific future NiSource activities are undertaken: local, state, or federal level permits or review may be required depending upon the nature and location of the activity. Potential direct or indirect impacts to visual resources (e.g., permanent clearing of vegetation, viewshed modification due to right-of-way construction and maintenance) would be considered on a project-by-project basis and would be subject to conditions of approval that are outside the scope of the ITP.

4.4.7 Noise

Analysis of noise relates to impacts surrounding generation of sound or sounds that are loud, unpleasant, unexpected, or undesired within the NCL due to the alternatives considered. Human responses to noise can vary depending on the time of day, sensitivity of the receptor (homes, schools, hospitals, etc.), the distance between the source of noise and the receptor, and the type of noise.

Overall, implementing either of the alternatives would not specifically authorize projects that would directly or indirectly affect potential noise-sensitive locales within the NCL area. As specific projects are undertaken, and depending upon the nature of the activity (e.g., heavy equipment operation, blasting, drilling), local noise ordinances, state noise regulations, or federal level permits or review by FERC may be required, and therefore impacts to noise sensitive areas would be minimized to the extent possible. For example, under the NGA, FERC regulations (18 CFR 380.12) require that a noise resource report be developed involving compressor facilities at new or existing compressor stations and for all new liquid natural gas facilities. FERC also evaluates noise levels due to certain construction activities such as HDD. Potential impacts on noise sensitive areas would be considered on a project-by-project basis. Such conditions of approval are beyond the scope of this EIS and independent of the issuance of the ITP or implementation of the HCP.