

Chapter 5 Cumulative Effects

5.1 Introduction

Cumulative impacts are defined in 40 CFR 1508.7 to mean “the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency (federal or non-federal) or person undertakes such other actions.” As was discussed in Chapter 4 previously, no ground disturbance or construction activity is directly authorized or included as part of the Service’s issuance of the ITP and approval of the HCP; therefore the Service’s action (Issuing an ITP or approving the HCP) would not have significant cumulative impacts upon resources within the NCL area.

The NCL area as it stands today includes an already existing 14,000+ mile natural gas system within an existing ROW. As such, in terms of past and present conditions NiSource constructed, and continues to legally operate this system under all necessary permits and authorizations as required by FERC and other action agencies at the time of project development. Such actions have already considered cumulative effects to the extent required under law (including prior NEPA). Furthermore, ongoing operation and maintenance of this facility would generally occur on previously disturbed land [NiSource estimates that 18,505 out of 19,409 annual acres will be impacted within previously disturbed lands (i.e., existing ROW and compressor stations) and would continue regardless of the Service’s issuance of the ITP or approval of the HCP. In addition, FERC generally considers O&M activities routine in nature related to impacts; and therefore they are arguably insignificant contributors to cumulative impacts for most resources, and in addition impacts to Take Species would be fully mitigated by NiSource via implementation of the HCP.

Any future construction projects (e.g., looping projects, storage fields) would be relatively small efforts which would build upon this existing 14,000+ mile pipeline system (estimated at 904 acres annually). However all future construction would still be subject to future NEPA analysis and cumulative effects analysis at the time that the particular project is proposed and authorization is requested from FERC, and any impacts to Take Species would be fully mitigated by NiSource via implementation of the HCP.

5.1.1 Approach

The geographic scope of the cumulative effects analysis area for each resource corresponds with the resource areas as described in Chapter 3. The time frame for the cumulative effects analysis corresponds with the 50-year permit duration included as part of the Proposed Action. General types of NiSource Covered Activities discussed as part of the Proposed Action are analyzed in Chapter 4 – Environmental Consequences.

Specific identification or quantification of past, present, and reasonably foreseeable future actions outside of NiSource’s purview is not feasible due to the extensive geographic scope and time frame defined for the Proposed Action. However, in general, many past and present human activities, in addition to those of NiSource, have occurred across the 9.8 million-acre NCL area over the last several centuries. Collectively these activities have had profound impacts upon the landscape; ranging from agricultural production to urban development; mining to timber harvesting; and energy development to transportation and infrastructure improvements. Similarly, one could presume that innumerable activities, similar in nature to what was described above, are reasonably foreseeable within the vicinity of the NCL area based on expected population increases, and associated urbanization, economic development, and infrastructure improvements including transportation, utilities, and other pipelines. Examples of such actions are included in **Table 5.1-1**.

Table 5.1-1: Overview of Past, Present and Future Actions within the NCL Area

Types of Actions	Associated Action/Facilities
Natural gas exploration, development and production	Exploratory drilling along with construction of well pads, well installation, associated pipelines and utility corridors, access, compressor stations. Potential for spills/releases and need for site reclamation.
Coal and other mineral exploration, development and production	Exploratory drilling and trenching along with access development; production within surface or underground mines along with associated access roads, processing plants, transportations, solid waste, tailings, etc. and site reclamation
Transmission and distribution systems	Development and improvements to utility corridors, including carrier pipelines, oil and gas pipelines, transmission lines, along with associated infrastructure (substations, access roads, fuel transfer stations) and potential for spills/releases.
Renewable energy development	Vegetation clearing, construction, access roads, hydropower generating stations

Types of Actions	Associated Action/Facilities
Commercial timber production	Timber and vegetation harvesting, access roads
Transportation/Infrastructure improvements	Construction and improvements to highways, roads, parkways, railroad construction or improvements.
Changes in land use, urbanization	Changes to forest land, grass lands, crop lands and other special uses to more urbanized use and changes to commercial, industrial or residential development.

Current NiSource activities are reflective of past actions taken by NiSource within the NCL. Some past NiSource actions within the NCL date back eighty years, predating NEPA and numerous other environmental laws and regulations. Recently, NiSource Gas Transmission and Storage (NGT&S) has had three pipeline and storage field projects constructed under the authority of FERC. NEPA analysis (Environmental Assessment or EIS) was conducted by FERC staff for each of these projects. Activities proposed, and ultimately approved by FERC for these three projects are summarized below:

Millennium Project – FERC Docket CP98-150-06

According to FERC Docket CP98-150-06 some of the key features of the Millennium project include the following:

- Construct and operate approximately 181.7 miles of 30-inch diameter pipeline from the Corning compressor station to the Ramapo station where the pipeline will connect with Algonquin;
- Replace approximately 1,278 feet of 10-inch diameter pipeline on Columbia's existing Line A with 24-inch diameter line in Orange County, New York;
- Operate 23 metering and regulating stations;
- Construct and operate a 15,002-horsepower compressor station and measuring and regulating facilities at a site adjacent to Columbia's existing Corning compressor station on property owned by Columbia;
- Construct the Wagoner measurement and regulation station in Deer Park, New York
- Install upgrades to the Ramapo station; and
- Modify the existing measurement and regulation stations at Tuxedo, Sloatsburg, and Ramapo to accommodate the replacement 30-inch line.

Hardy Storage - FERC Docket CP05-144

According to FERC Docket CP05-144, Hardy Storage, a subsidiary of NiSource, proposed to convert two partially depleted gas production fields that are connected to Columbia facilities to a storage field located in Hampshire and Hardy Counties, West Virginia. Hardy Storage's storage field proposal consisted of two pools: the Lost River pool, which begins a few miles from Columbia's Lost River Compressor Station and originally contained 11 inactive production wells; and the Inkerman pool, which began approximately 19.6 miles north of Lost River Compressor Station extending into Hampshire County and originally contained 4 inactive production wells. Hardy Storage proposed to connect both pools by new storage pipelines to a new Hardy Storage Compressor Station, and from there, connected by a new storage pipeline to Columbia's Lost River Compressor Station. In all, the proposal stated that Hardy Storage would construct or recondition a total of 29 storage wells, construct 36.7 miles of pipeline, 7,100 horsepower of compression, and associated appurtenances, as well as install 26 new 4-inch, 6-inch, and 8-inch pipelines for reconditioned production wells and new storage wells. Hardy also proposed to install ground beds, repeater towers, access roads and a methanol injection system.

Ohio Storage – FERC Docket CP08-431

According to the EA completed by FERC for this project, the Ohio Storage Expansion Project proposed to provide an additional 103,400 dekatherms per day of storage deliverability for service in the eastern United States and to increase storage capacity at these fields by 6.7 billion cubic feet (Bcf) of natural gas. Specifically the project would add 3.0 Bcf within the Crawford Storage Field (Fairfield and Hocking Counties, Ohio) and 3.7 Bcf within the Weaver Storage Field (Ashland and Holmes Counties, Ohio). The project would not result in an expansion of the certificated storage field boundaries or increase the maximum operating pressure within the respective storage fields. Basic project components are described below:

- **Crawford Storage Field Pipelines** - Columbia would construct a total of about 13.4 miles of interconnecting pipeline at 42 locations within the Crawford Storage Field including approximately 1.2 miles of abandonment by replacement of existing pipeline, ranging in size from 4- to 8-inches in diameter. In addition, approximately 0.2 mile of existing pipeline would be abandoned-in-place as a result of project activities.

- **Crawford Storage Field Wells** - Columbia would construct new storage wells, as well as upgrades and conversions of existing wells, within the existing storage field boundary. Namely, Columbia would install 19 new storage wells in previously undisturbed sites located within the limits of the existing storage field; these wells would require new permanent rights-of-way and access roads; convert 11 existing counter storage wells to injection/withdrawal uses; convert 10 existing observation wells to counter storage or injection/withdrawal wells; convert two injection/withdrawal wells to counter-storage wells; and purchase and convert the four Rose Run wells to storage wells.
- **Crawford Compressor Station** - Columbia would make minor modifications to the existing Crawford Compressor Station within the limits of the existing station yard in the Crawford Storage Field.
- **Weaver Storage Field Wells** - The Weaver Storage Field in Ohio currently consists of more than 150 wells. Columbia would recondition 21 of these wells, 12 of which are located within the boundary of Mohican Memorial State Forest.
- **Weaver Storage Field Pipelines** - Columbia would install approximately 4.15 miles of new 6-inch-diameter high-density polyethylene (HDPE) plastic natural gas pipeline in a new permanent right-of way; abandon and remove a total of 1.7 miles of 2-inch-diameter plastic pipeline at two locations, and replace these segments with a new 6-inch-diameter HDPE plastic pipeline (installed within the existing permanent right-of-way) install one meter station; install one regulation station; and install one mainline valve setting.

Types of Impacts

Generalized impacts, as described below from the Ohio Storage Expansion Project EA (FERC, 2008) can serve as a model for how generalized project-related impacts are typically avoided, minimized or mitigated via the use of NiSource's ECS, FERC Plan and Procedures, and BMPs.

- **Geology/Blasting** - Blasting may be required for construction of some pipelines. To avoid damage, NiSource conducts blasting in compliance with all state and federal regulations, conducts appropriate pre-blasting geotechnical investigations, and develops specific blasting operations and monitoring plans to address site-specific conditions such as location, terrain, soil and rock types, type of explosives, charge weight and configuration, depth of charge, spacing between charges, simultaneous detonation or

microsecond delays, distance to the nearest structure, and the placement of blasting mats over the affected area.

- **Soils** - The potential impacts on soils from construction can occur depending upon local conditions due to erosion hazards, soil mixing, soil compaction potential, introduction of rock to the topsoil, and poor revegetation potential. NiSource would avoid or minimize impacts during construction and operation of the project by utilizing its ECS which, in turn, incorporate FERC Plan and Procedures.
- **Groundwater** - Although proposed pipeline construction activities could affect groundwater resources, most potential impacts would be avoided or minimized by use of the standard and specialized construction techniques, and adherence to the NiSource ECS. Some of the minor, temporary impacts which may be sustained, but would not permanently impact the quantity or quality of groundwater are as follows: Shallow aquifers could sustain minor impacts from changes in overland water flow and recharge caused by clearing and grading of the proposed rights-of-way and well construction/conversion activities; near-surface soil compaction caused by heavy construction vehicles could reduce the soil's ability to absorb water, which could increase surface runoff and the potential for ponding; and water infiltration in forested areas would be reduced until vegetation is reestablished.
- Potential dewatering impacts would also be would be temporary in nature. Water table elevations typically reestablish quickly because pipeline construction would be completed within a short period of time and dewatering would occur in vegetated areas adjacent to construction allowing for groundwater recharge. Any water produced from conversion activities would be piped directly from the well to a temporary flow-back tank and then loaded into a vacuum truck for disposal. Water produced from drilling activities associated with the proposed wells would be discharged into an open lined pit.
- NiSource also implements preventative measures and response procedures contained within its Spill Prevention, Control and Countermeasures (SPCC) Plan in its ECS. NiSource typically conducts pre-drill testing of potable water supply wells within 150 feet of the work areas within two months of commencement of drilling activities. Post-drill testing would be conducted if the landowner indicates that their water supply has been potentially impacted. In the event a potable water well were damaged as a result of

project construction activities, NiSource would provide a new water source and/or compensate the landowner.

- **Wildlife** - Within project construction areas, impacts on wildlife populations would result primarily from initial right-of-way, well pad, and access clearing. Many animal species are mobile and would avoid direct impacts. Therefore, the main impacts on wildlife would be displacement into adjacent habitats.
- **Fisheries** - Impacts on fisheries from pipeline and well pad construction could occur due to sedimentation and turbidity, destruction of stream cover, introduction of water pollutants, interruption of fish migration and spawning, entrainment of fish, inadvertent release of drilling mud during the drilling of new storage wells or in-stream blasting. Dry and wet crossing techniques would require the clearing of streamside vegetation and could result in reduced shading and possible increases in water temperature in some of the streams, as well as the potential displacement of fish that normally reside in these areas. Construction activities could also disrupt benthic communities. However, these effects would be relatively minor because of the small area that would be affected at each stream.
- **Surface Water** - During construction, NiSource would adhere to its ECSs and implement soil erosion and sediment control measures to minimize impacts on surface water quality. NiSource's crossing method procedures are consistent FERC Plan and Procedures, and include crossing at as close to perpendicular as possible, maintaining flow rates, and clearly identifying waterbody buffers.
- Potential localized and short-term impacts from clearing and grading, in-stream trenching, trench dewatering, and backfilling could modify aquatic habitat, increase sedimentation rates and turbidity, decrease dissolved oxygen concentrations, increase water temperature, and introduce fuels and oils from accidental spills. The degree of impact would depend, in part, on the flow volume in the streams. If the streams are flowing during construction, clearing, grading, and trenching within and adjacent to those streams could affect water quality. Impacts on streams as a result of well pad construction would be limited to the clearing and grading adjacent to streams. Typically, stream bank vegetation would be left in-tact and in-stream construction would not occur from well pad construction.

- **Wetlands** - NiSource generally sites projects to avoid wetlands as much as practicable. However, if unavoidable wetland impacts occur, they would include the temporary and permanent alteration of wetland vegetation; particularly during and immediately following construction. Generally, following construction the wetland vegetation community would transition back into a community with a function similar to that of the wetland prior to construction. Mitigation for all wetland crossings would be performed in accordance with NiSource's ECS, which incorporate FERC Plan and Procedures as well as all applicable permit requirements. Mitigations may include installation, crossing procedures, temporary sediment control, restoration, and post-construction maintenance of wetlands and waterbodies. NiSource also requires the use of trench breakers or sealing of the trench bottom, to prevent the drainage of perched water tables or other changes in wetland hydrology, thereby minimizing the potential impacts on aquatic resources from wetland impacts.
- **Vegetation/Land Use** - Vegetation related impacts from construction and pipeline operation would include cutting, clearing, and/or removal of existing vegetation within the construction work areas. The degree of impact would depend on the type and amount of vegetation affected, the rate at which the vegetation would regenerate after construction, and the frequency of vegetation maintenance conducted during operation. Long-term impacts would result for areas of maintained rights-of-way and well pads and any above-ground facilities. The temporary construction right-of-way would be allowed to revert (e.g., forested vegetation) after construction is complete. To minimize long-term impacts, NiSource would follow its ECS for construction, restoration, and maintenance.
- **Visual** - Visual impacts associated with the construction rights-of-way and additional temporary workspaces could result from removal of existing vegetation (including trees) and exposure of bare soils. Visual impacts would be greatest where the project parallels or crosses roads, trails, or prominent observation points. NiSource typically minimizes impacts on visual sightlines by paralleling and overlapping existing rights-of-way where possible and visual impacts from trail crossings would be minimized by its construction methods and locations of crossings. Any aboveground facilities would have a permanent impact on visual resources, but would depend on the pre-construction condition of the area and visibility of the facilities from the surrounding area.

- **Air Quality** - Some temporary, localized impacts related to fugitive dust and construction equipment emissions may result from the construction of a project. Given the temporary nature of the project and implementation of BMPs, emissions associated with the construction phase would not result in a significant impact on air quality. During operation, potential impacts to air quality would be minimized by strict adherence to all applicable federal and state regulations.
- **Noise** - Noise would potentially affect the local environment during the construction period at various individual projects. People around these project sites would likely hear daytime and nighttime construction noise, but the overall impact would be temporary.

Present and foreseeable future NiSource actions are performed pursuant to regulations and oversight of the FERC, the USDOT, and other regulatory authorities. NiSource actions can be divided into three main categories of actions that are associated with (1) general operation and maintenance; (2) safety-related repairs, replacements, and maintenance; and (3) certain expansion activities. These actions are anticipated to impact the NCL as follows:

Anticipated Annual Impacts From Future NiSource Actions within the NCL

	Total Acreage (annual)	Pipeline			Storage Field		Compressor Station	
		Length (miles)	Existing ROW (acres)	New Disturbance (acres)	Existing Storage Field (acres)	New Disturbance (acres)	Existing Compressor Station (acres)	New Disturbance (acres)
<i>Right-of-way Vegetation Maintenance</i>	16,667	na	16,667	0	incl	incl	incl	incl
<i>Operations & Maintenance</i>	1102	na	1046	56	incl	incl	incl	incl
<i>Capital Expansion Project - Medium (occurs every other year)</i>	670	50	303	303	0	60	4	0
<i>Capital Expansion Project - Large (occurs every fifth year)</i>	970.0	80	485	485	na	na	incl	incl
Totals	19,409	na	18,501	844	0	60	4	0

Such actions could have impacts on the physical, biological, and social environment regardless of the issuance of the ITP or acceptance of the HCP. However, the exact locations and types of such actions cannot be quantified or described in any detail given the vastness of the NCL area and the extended timeframe (50-year) being considered as part of this NEPA analysis. As such, all discussions of reasonably foreseeable actions and potential impacts from such actions are described qualitatively. Moreover, impacts from such broad types of activities cannot be simply added together given that they may occur over vastly different timeframes, cover different footprints, or occur over widely different locations within the NCL area.

All commercial, industrial, and residential development along with related infrastructure improvements would be carried out in accordance with all applicable federal, state, and local laws and regulations that might apply to a particular development activity. Any future activities undertaken by another entity or future NiSource construction activities within the vicinity of the NCL area would necessitate additional permitting and authorizations outside the purview of this EIS document. As required by law, the burden of any cumulative effects analysis due to the proposal of a particular construction project in the future would fall upon future NEPA review by FERC and other cooperating agencies to determine the cumulative effects of that proposed project given the existing NiSource pipeline infrastructure is already in place.

Given the above, the impacts of potential future activities associated with approval of NiSource's ITP and HCP would be minimal from a cumulative effects standpoint. Generalized, qualitative cumulative effects for a range of general activity types are presented below for the three main resource areas: Physical Resources, Biological Resources, and Social Resources.

5.2 Physical Resources

No current or future ground disturbance or construction activity is directly authorized by the Service via selection of the Proposed Action (Service's issuance of the ITP and approval of the HCP) or any of the Action Alternatives. As such, all future construction activities will be subject to future NEPA analysis and cumulative effects analysis by FERC at the time authorization for a project is sought. NiSource's Covered Activities are not expected to contribute cumulatively to loss of physical resources, including surface water, groundwater, geology, soils, hazardous materials, climate or air quality, nor are they considered to create a separate, additive cumulative effect to any physical resources beyond that which already exists with the NCL area. Broadly, cumulative impacts could include impacts on surface waters or groundwater due to inadvertent spills or contamination; impacts on geologic resources due to limiting of access to

mineral resources; impacts on soils due to topsoil loss, erosion, and contamination; and impacts on air quality, due to fugitive dust emissions and regional pollutants. Below are some general examples of how various physical resource areas could be affected by a range of activity types.

5.2.1 Surface Water

Future development pressure (including commercial, industrial, and residential development) could result in impacts to localized surface water quality due to site-specific construction or due to development-related runoff from increased impervious surfaces within the NCL area. Moreover, linear transportation, utility, or other pipeline projects could also impact surface water resources as a result of construction activity or due to trenching and other stream bed and bank work. In general, the more energy-related or other development pressure that occurs the more likely the potential for surface water contamination due to potential for hazardous substance release and due to run-off and erosion from construction-related activities. However, local, state, and federal laws already in place to control storm water runoff should minimize the potential for future erosion and runoff to impact surface waters.

5.2.2 Ground Water

Cumulative impacts of past, present, and future actions on the quantity and quality of groundwater would be variable and site-specific. Depending upon local groundwater conditions, groundwater resources in some portions of the NCL area could be impacted (altering groundwater recharge or contaminating groundwater from spills) due to future construction activities proposed by NiSource or other entities, as well as due to other types of commercial, industrial, or residential development. In general, the more energy-related or other development pressure that occurs the more likely the potential for ground water degradation due to potential for hazardous substance releases. Groundwater availability (quantity) is not likely to be impacted due to variations in rates of precipitation and groundwater recharge rates which are outside the influence of any past, present, or future actions.

5.2.3 Geology

Cumulative impacts of past, present, and future actions in regards to geologic resources, specifically in regards to mineral extraction capability, along with topography and seismic characteristics, would be variable and site-specific. Localized impacts to geological resources may occur if future commercial, industrial, or residential development and associated infrastructure improvements limits access to geological resources (e.g., minerals, natural gas,

and oil) in regards to limiting their extraction potential. Many potential future projects, especially transportation and utility corridors, and urban development, are not compatible with mining activities due to related noise, visual, and safety impacts, generally making these forms of development and geologic resource extraction activities mutually exclusive, further limiting potential extraction areas that are already constrained from activity in the NCL area (due to safety concerns in regards to the pipeline). Impacts to topography and seismic potential from most potential development activities would be highly localized, likely due to grading or foundation activities. Alternately, the topographic and seismic impacts from potential mineral extraction activities would likely be larger in physical scope, temporal length, and overall impact potential; however, due to the spatial scope of the NCL area, with the associated variety of mineral resources and mining activities, a more detailed analysis of these potential impacts is not feasible, and would need to be covered more thoroughly in future project specific NEPA analyses.

5.2.4 Soils

Future commercial, industrial, or residential development in the NCL area have the potential to result in localized direct loss of topsoil resources via land conversion from agricultural or forest-based land uses to development, as well as from indirect soil loss due to erosion. Soils could also be contaminated with petroleum or chemicals due to spills or releases from construction related efforts associated with development (e.g., industrial, commercial and energy development). Cumulative impacts from these potential projects, along with NiSource's future actions, could occur if periods of construction are coincident, or activities occur in areas with highly erodible soils, leading to short-term increases in soil erosion during construction. Additionally, cumulative impacts could be seen in the form of permanent removal or covering of topsoil during development. Local, state, and federal laws, already in place to control storm water runoff, should minimize potential future erosion and runoff from either NiSource's covered activities or from other potential projects. Additionally, spill control plans would help to minimize the potential for spills or releases to occur and would provide a plan of action to follow in the event contamination does occur. Finally, standard BMPs for erosion control would be utilized for all construction and maintenance activities, limiting the potential for these to result in impacts.

5.2.5 Climate

Cumulative impacts of past, present, and future actions in regards to local and regional climate would be variable and site-specific. Due to a lack of anticipated climatological impacts from the NiSource covered activities, no additional cumulative impact to climate would be anticipated.

5.2.6 Air Quality

Potential cumulative effects of past, present, and future actions to air quality throughout the NCL area and surrounding environs could result due to a potential increase in natural gas development, industrial development, transportation and infrastructure development, as well as urbanization throughout the area. Typical types of impacts could include increases in dust emissions, exhaust emissions, fuel combustion emissions, and chemical/petroleum spills or releases. In general, the contribution of construction activities to degraded air quality would be fairly localized and short in duration. Localized impacts could include a short-term contribution to regional pollutants as well as fugitive dust emissions. Future operation and maintenance activities from natural gas or other industrial development would not likely produce a long term impact on air quality as such activities typically must file for air quality permits and/or be in compliance with local and regional air quality standards. An increase in population and associated transportation networks could result in an overall increase in exhaust emissions compared to what exists today.

5.3 Biological Resources

No current or future ground disturbance or construction activity is directly authorized by the Service via selection of the Proposed Action (Service's issuance of the ITP and approval of the HCP) or any of the Action Alternatives. As such, all future construction activities will be subject to future NEPA analysis and cumulative effects analysis by FERC at the time authorization for a project is sought. NiSource's Covered Activities are not expected to contribute cumulatively to loss of biological resources, including vegetation, wetlands, fish, wildlife and special status species, nor are they considered to create a separate, additive cumulative effect to any biological resources beyond that which already exists with the NCL area.

Broadly, cumulative impacts could include impacts on vegetation due to destruction of vegetation, habitat fragmentation, or contamination/invasion; cumulative impacts on wetlands, due to destruction or contamination; and cumulative impacts on wildlife and fish, including special status species, due to destruction or modification of habitat, interference with life

processes, or direct harm or mortality. Below are some general examples of how various biological resource areas could be affected by a range of activity types.

5.3.1 Vegetation

Cumulative impacts of past, present, and future actions on the vegetation and habitats would be variable and site-specific. Depending upon local conditions, vegetation and groundcover in some portions of the NCL area could be impacted (e.g., deforestation and destruction of vegetation, fragmentation, contamination due to chemical or petroleum spills or releases, and increases in invasive species) due to future construction activities proposed by NiSource or other entities, as well as due to other types of commercial, industrial, or residential development. In general, the more energy-related or other development pressure that occurs the more likely the potential for vegetation and habitat changes due to land conversion or community impacts.

5.3.2 Wetlands

Cumulative impacts of past, present, and future actions on wetland habitats would be variable and site-specific. Depending upon local conditions, wetland resources in some portions of the NCL area could be impacted (e.g., dredge and fill, degradation, contamination due to spills or releases) due to future construction activities proposed by NiSource or other entities, as well as due to other types of commercial, industrial, or residential development. In general, the more energy-related or other development pressure that occurs the more likely the potential for wetland degradation due to land conversion or inadvertent contamination. However state and federal laws (e.g., Section 404/401 Certification) already in place to protect wetlands would minimize or mitigate such potential impacts.

5.3.3 Wildlife and Fish

Cumulative impacts of past, present, and future actions on wildlife and fish due to future construction activities proposed by NiSource or other entities, as well as due to other types of commercial, industrial, or residential development on wildlife and fish would be variable and site-specific. For example, adverse impacts within portions of the NCL might include direct injury or mortality, impacts due to contamination, habitat fragmentation, interference with migration or other behavioral traits, increase in water temperature, and degradation of water quality. In general, the more energy-related or other development pressure that occurs the more likely it is for such wildlife and fish related impacts to occur.

5.3.4 T&E and Candidate Species

Cumulative impacts of past, present, and future actions on special status species due to future construction activities proposed by NiSource or other entities, as well as due to other types of commercial, industrial or residential development would be similar to those on other wildlife and fish species as discussed in **Section 5.3.3**. Impacts on special status species would be variable and site-specific. Adverse impacts within portions of the NCL might include direct injury or mortality, impacts due to contamination, habitat fragmentation, interference with migration or other behavioral traits, increase in water temperature, and degradation of water quality. In general, the more development pressure that occurs the more likely it is for such special status species related impacts to occur. Through the application of the species-specific and general AMMs (as described in **Section 4.3.4** and **Appendix E**) and mitigation, HCP Species impacts would be avoided, reduced or compensated for in regards to NiSource activities. Similarly, local, state, and federal wildlife laws such as the ESA would serve to reduce the potential for impacts from other potential projects in the area.

5.4 Social Resources

No current or future ground disturbance or construction activity is directly authorized by the Service via selection of the Proposed Action (Service's issuance of the ITP and approval of the HCP) or any of the Action Alternatives. As such, all future construction activities will be subject to future NEPA analysis and cumulative effects analysis by FERC at the time authorization for a project is sought. Given the above, NiSource's Covered Activities are not expected to contribute cumulatively to loss or negative/adverse impacts to social resources, including land use, socioeconomic conditions, transportation and utilities, cultural resources, recreation, visual resources or noise, nor are they considered to create a separate, additive cumulative effect to any social resources beyond that which already exists with the NCL area.

Broadly, cumulative impacts could include impacts on land use and recreation due to incompatible land uses or restricted access; cumulative impacts on socioeconomics or environmental justice due to alterations to local or regional economies; cumulative impacts on transportation and utilities due to increased congestion or interruption of service; cumulative impacts on cultural resources due to inadvertent destruction or degradation; cumulative impacts on visual resources due to incompatible land uses, and cumulative impacts on noise due to short-term increases in ambient noise during construction activities. The subsections below

outline general examples of how various social resource areas could be affected by a range of general activity types.

5.4.1 Land Use

Potential cumulative effects of past, present, and future actions on land use due to future construction activities proposed by NiSource or other entities, as well as due to other types of commercial, industrial, or residential development would vary state-to-state, county-to-county, and city-to-city. Land conversion due to increased urbanization of private lands and an increase in commercial and industrial activity could result in an increase in incompatible land uses. The potential for this will vary somewhat within the NCL area depending upon the nature and extent of local zoning and land use restrictions.

5.4.2 Socioeconomics and Environmental Justice

Potential cumulative effects of past, present, and future actions on local, regional or state economies and environmental justice due to future construction activities proposed by NiSource or other entities, as well as due to other types of commercial, industrial, or residential development would vary state-to-state, county-to-county, and city-to-city. Any future urbanization that occurs within the NCL area, as well as industrial development and associated transportation and infrastructure development could translate into an increase in population within the general vicinity of that development, along with potential changes to employment, tax revenues, and personal income. No specific environmental justice effects are anticipated to occur to low income or minority populations due to such cumulative actions.

5.4.3 Transportation and Utilities

Potential cumulative effects of past, present, and future actions on transportation and utilities due to future construction activities proposed by NiSource or other entities, as well as due to other types of commercial, industrial, or residential development would vary greatly within the NCL area. Increased urbanization of private lands and an increase in commercial and industrial activity could result in associated improvements to, and expansion of, the transportation network and utility networks within and surrounding the NCL area. Potential impacts could include increased congestion on existing or future transportation networks, and construction-related interruption of service on existing or future utility networks.

5.4.4 Cultural Resources

Potential cumulative effects of past, present, and future actions on cultural resources (such as damage or destruction of artifacts) due to future construction activities proposed by NiSource or other entities, as well as due to other types of commercial, industrial, or residential development would vary across the NLC area. Any future urbanization that occurs, as well as industrial development and associated transportation and infrastructure development could negatively affect culturally significant resources due to inadvertent destruction or degradation. Regardless, compliance with Section 106 and associated state-specific regulations for new construction projects within the NCL area will occur on a project-by-project basis for those NiSource covered activities requiring such approvals, as well as for other future construction activities proposed by other entities, limiting the potential for future impacts.

5.4.5 Recreation

Potential cumulative effects of past, present, and future actions on recreational use and access to recreational lands due to future construction activities proposed by NiSource or other entities, as well as due to other types of commercial, industrial, or residential development would vary state-to-state, county-to-county, and city-to-city. Land conversion due to increased urbanization of private lands and an increase in commercial and industrial activity could result in an increase in incompatible land uses which in turn could impact both the quality of certain recreational experiences as well as the availability of lands for recreational use. The potential for impacts will vary somewhat within the NCL area depending upon the nature and extent of local zoning and restrictions on local, state and federal public lands.

5.4.6 Visual

Potential cumulative effects of past, present, and future actions on visual resources throughout the NCL area and surrounding environs relates primarily to urbanization, as well as industrial development and associated transportation and infrastructure development. Land conversion due to increased urbanization of private lands and an increase in commercial and industrial activity could result in an increase of contrasting surrounding landscapes which in turn could impact or degrade the visual quality in some areas, although visual quality regulations do not necessary apply to all areas within NiSource's covered lands.

5.4.7 Noise

Potential cumulative effects of past, present, and future actions on noise receptors throughout the NCL area and surrounding environs relates to a potential increase in natural gas development, industrial development, transportation and infrastructure development, as well as urbanization throughout the area. The contribution of future construction activities proposed by NiSource or other entities to these general types of impacts would likely be fairly localized and short in duration. Localized impacts could include a short-term contribution to ambient noise levels due to earthmoving, blasting, as well as general construction activities. Future operation and maintenance activities would not likely produce a long term impact on ambient noise levels.