INTRODUCTION
According to the U.S. Forest Service Handbook 1909.15-2011-1 Chapter 10, Section 18.4, the Forest Service must periodically review environmental documents to determine if they need to be corrected, supplemented, or revised. This SIR is prepared in compliance with Section 18.4 and to enable the U.S. Forest Service to review the environmental documents supporting a Special Use Permit for the requested use of two areas on the Caddo-LBJ for ecological instrumentation and observation.

THE PROPOSED ACTION
U.S. Forest Service Issuance of Special Use Permit
The proposed action under review is the U.S. Forest Service issuance of a Special Use Permit that would allow activities, proposed by the National Science Foundation (NSF) and the NSF-funded National Ecological Observatory Network (NEON), to occur on the Caddo-Lyndon B. Johnson National Grassland Of Texas (Caddo-LBJ). The Special Use proposed by the NSF and NEON (the Proponents) involves conducting the following activities in two areas on the Caddo-LBJ: (1) the construction/ installation/ establishment of equipment and instrumentation, supporting infrastructure, and ecological-study sites; (2) continuous and periodic data collection and ecological investigations; and (3) the removal of infrastructure and the restoration of disturbed areas at the end of the research-term (30 years).

Requested Special Use of Caddo-LBJ Lands: Activities Previously Analyzed by the NSF
The activities proposed in the NSF/NEON application for a Caddo-LBJ Special Use Permit, are activities included in the analysis of the proposed action discussed within a 2009 NSF Environmental Assessment (EA): The National Science Foundation, National Ecological Observatory Network (NEON) Environmental Assessment, published November, 26, 2009. This NSF 2009 EA (referred to herein as the 2009 NSF NEON EA, the 2009 EA, or the EA) is accessible at http://www.nsf.gov/bio/outreach/final_neon_ea_addendum_a_combined.pdf. The NSF published a corresponding Finding of No Significant Impact (FONSI) for the 2009 NSF NEON EA on December 9, 2009.

Requested Special Use Activities: Changes In the Activities Previously Analyzed
As their planning efforts for their Caddo-LBJ proposed-activities have progressed, the Proponents are now able to provide information that was not available during, or that have changed since, the preparation of the 2009 NSF NEON EA. The activities that the Proponents currently propose for the Caddo-LBJ Special Use have been slightly altered from those originally analyzed and described in the 2009 EA. The Proponents are able to supply additional information and describe how the activities originally analyzed and described in the 2009 EA differ from those currently proposed.
Therefore, this document was prepared to enable the U.S. Forest Service to review the Proponents’ current application for a Special Use Permit and the environmental documentation that was previously prepared for the activities proposed for this requested Special Use of public land. This document provides a brief description of how the activities and the analysis of the potential environmental impacts originally presented in the original 2009 NSF NEON EA would be changed given the differences in the currently proposed activities.

Appendix A provides additional details and discussion of changes.

The currently proposed activities are described in the National Ecological Observatory Network (NEON), Domain 11 Core Tower, Soil Plot Array, Terrestrial Sampling, Aquatic Array, and Aquatic Sampling at Lyndon B. Johnson National Grasslands, Proposal to USFS, Lyndon B. Johnson National Grasslands. This proposal is included as Attachment A.

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APPENDIX

A. Discussion of changes to the 2009 EA, A review of how the analysis, discussion, and effects determination of the 2009 EA would be altered given the differences in the activities currently proposed in the NSF’s NEON Caddo-LBJ Special Use Permit application.

ATTACHMENTS

A. National Ecological Observatory Network (NEON), Domain 11 Core Tower, Soil Sampling Array, Terrestrial Sampling, Aquatic Array, and Aquatic Sampling at Lyndon B. Johnson National Grasslands, Proposal to USFS, Lyndon B. Johnson National Grasslands. (Proposal of currently proposed activities.)

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*Please note: Some changes in this chart represent a decrease in project scope.*
EXECUTIVE SUMMARY:
This section would remain much the same except for several statements that refer to project construction or operation elements that would be different than originally proposed.

This section of the EA summarizes the EA Conclusions. The analysis documented in the EA would need to reflect new information that has become available since the writing of the EA and multiple project changes. Vegetation, wetland, and cultural resource surveys have been conducted at the currently proposed project sites and the reports from those surveys have provided new information. Examples of the larger changes in the construction and operation elements are: the reduction in the number of sites from four sites to two sites; change in site locations; greater soil and vegetation disturbances (rather than the 0.01ha (0.025 acres) or 0 acres described in the EA, 0.53 and 0.47 acres of disturbance would result from the implementation of the terrestrial and the aquatic sites); the use of motorized equipment for bringing equipment to and from the site; the use of motorized equipment for trenching and drilling efforts (rather than the hand-carrying described in the EA); changes in operations (the biweekly rather than weekly checking of invertebrate sampling traps, the lack of operational spill prevention plans, changes in the implementation of BMPs relating to bird surveys, bird and mammal diversions, and the flagging of guy wires). Several of the above changes are mentioned within the Executive Summary’s Conclusions statements and would need to be altered. Changes to the EA Conclusions are described in detail below in the discussion of the EA’s Section 4.

1.0 PURPOSE, NEED, AND SCOPE
No changes would be needed.

2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES
Only small alterations within figures and the EA-text would be needed. These changes are needed due to the slight relocation of proposed Caddo-LBJ sites and changes within the components described in this section. There would be fewer components (less infrastructure installed) and the site-locations, although fewer, have also been relocated to sites nearby two of the originally considered sites.

2.1 Site Selection and Alternatives Considered but Not Carried Forward
This subsection could be changed to include the slight shift of the sites at the Caddo-LBJ. Within the subsection, several examples of site shift are listed. The sites at the Caddo-LBJ were shifted due to the scientific suitability of the originally-proposed and the currently-proposed sites.

2.2 Proposed Action (Preferred Alternative)
Figures would need to be changed to depict built-sites and currently-proposed sites, including the changed locations of the currently-proposed Caddo-LBJ sites.
2.2.1 NEON Components
Changes would need to be made to the list and dimensions of NEON site-components and several descriptions of project activities. One tower is currently-proposed (rather than three towers). Several components listed in the EA are not proposed for the Caddo-LBJ sites. The 2009-EA-dimensions for several components do not match the components currently-proposed. The amount of ground disturbance resulting from construction that was originally provided would need to be corrected (from <0.1ha for the terrestrial site and 0 acres for the aquatic site, to 0.51 acres for the terrestrial site and up to 0.47 acres for the aquatic site). Equipment would not be carried by hand to the sites as described in the 2009 EA. Conduit-trenching would not be completed using a walk-behind trencher. A new soil sampling effort that was not discussed in the 2009 EA would be implemented at the Caddo-LBJ sites. The description of groundwater well activities would need to be altered (samples would be taken and hang-augers would not be used). Also, the terrestrial sampling described in the 2009 EA does not match the current NEON protocols (those proposed for the Caddo-LBJ): the size of the sampling area is much smaller than those described in the EA and there would be biweekly checking of invertebrate sampling traps rather than the weekly checking described in the EA. The amount of and number of terrestrial sampling sites in the 2009 EA is not accurate for the Caddo-LBJ proposed activities. The above changes in the NEON components (the site design and analyzed activities planned) would impact the analysis and discussions throughout the EA, but most of the effects-determinations would remain the same (as summarized below and discussed throughout this document).

2.2.2 Project Design Features to Minimize or Avoid Impacts
Changes to the list of project design features would be needed to reflect the currently-proposed Caddo-LBJ NEON activities. Not all features listed would be implemented (e.g., a walk-behind trencher would not be used).

2.2.3 Ecological Domains
As this subsection only provides a general description of the Domains and sites, only small changes would be needed due to the relocation of and reduction in the number of sites currently-proposed.

2.2.3.11 Ecological Domain 11
No changes would be needed.

2.2.4 Project Closure
Although not addressed in this subsection of the 2009 EA, the following discussion and needed correction would need to be added to this subsection. Upon project closure, machinery would also be required to remove heavy and large equipment and materials from the site.

2.3 No Action Alternative
No changes would be needed.
3.0 AFFECTED ENVIRONMENT & ENVIRONMENTAL CONSEQUENCES
The section and the subsections within this section would need to be altered given the changes in the currently-proposed activities, the availability of new information, or the need for corrections in the 2009 EA-text.

3.1 Introduction
No changes would be needed. This section remains the same (as it only provides a discussion of the terminology utilized throughout the document (Introduction, Direct versus Indirect Effects, Short-Term versus Long-Term Effects, Intensity of Effects, Significance, Cumulative Effects, Mitigation).

3.2 Resource Areas Considered But Not Addressed for Specific Domains
No changes needed.

3.2.1 Resource Areas With No Potential for Significant Impacts
Several statements would need to be corrected within this section’s subsections. The 2009 EA analysis determined that there was no potential to affect five resource areas. The changes within the below subsections involve the changes in project activities or components or site locations. The determination of “No potential for significant impacts” for the five resources described would remain given the changes in the currently-proposed activities.

3.2.1.1 Land Use
This subsection would remain mostly the same. The 2009 EA-statement that less than 0.01 hectare (ha) of land would be occupied by NEON infrastructure at any site in a domain would need to be corrected. The infrastructure footprint will still remain very small given the area of the surrounding environment and the impacts to land use would remain the same.

3.2.1.2 Topography
This subsection would remain mostly the same. The statement regarding the size of the tower pad would need to be corrected, as the size of the tower pad may be of slightly different proportions. Other small earthmoving activities that would also be required for site installation were not described in the 2009 EA. All earthmoving activities would remain small in size and disturbance and therefore the impacts to topography would remain very slight.

3.2.1.3 Hydrogeology and Groundwater
Three statements would need to be corrected in this subsection. The statements that would need to be corrected include; (1) NEON would not be sampling groundwater, (2) wells would be hand-augured, and (3) the potential depths of the hand-augured wells would be within 35 cm. of the ground surface. NEON would be sampling groundwater, but the amount of groundwater taken and impacted would be negligible. The groundwater wells will not be hand-augured but the least destructive/invasive equipment and means of drilling and appropriate BMPs would be utilized for installing groundwater wells. Depths at which groundwater would be reached at different sites was not available when the 2009 EA was written. The
depth to which the wells would need to be dug at each site would vary and depend on the substrate.

3.2.1.4 Wild and Scenic Rivers
No changes needed.

3.2.1.5 Demographics
No changes needed.

3.2.1.6 Community Resources
No changes needed.

3.2.2 Resource Areas with Similar Impacts Across All Domains
This subsection would need only slight alterations given the changes in the currently proposed activities and the availability of new information or need for corrections in the 2009 EA. The following EA-subsections described the potential impacts to the resource areas projected to be impacted similarly at all sites.

3.2.2.1 Hydrology
This subsection would remain mostly the same. There would be a lesser amount of impervious surface area created due to the installation of fewer towers and less infrastructure installed for the currently-proposed activities.

3.2.2.2 Hazardous and Toxic Substances
This subsection would need to be altered as NEON’s protocols have changed since the writing of the 2009 EA and SPCC plans are not developed and implemented by NEON at construction sites. Construction contractors are responsible for implementing spill prevention measures during construction.

3.2.2.3 Socioeconomic Impacts on the Local Economy
No changes needed.

3.3 Resource Areas Considered in Detail for Domains
The subsections listed and described below would remain mostly the same as they describe only the analysis used to assess impacts to resource areas. The analysis results are discussed in detail within the Domain-specific subsection 3.5.

3.3.1 Geology
No changes needed.

3.3.2 Soils
This subsection would need to be altered as new soil information is available and changes have been
made regarding project location, components, and design. Changes needed involve corrections to the locations and amounts of the 2009 EA-estimates of soil disturbance required for site construction. These corrections include the differences in currently-proposed site locations, the amount and sources of ground disturbance required for site construction, and the addition of the NEON soil survey site-component (a soil-disturbing activity). Details of the new soil effort details are included in Attachment D. NEON has also gained additional soils information as a geotechnical engineering services report was completed at the tower site on September 12, 2013. A copy of the report is included in Attachment E.

3.3.3 Climate
No changes needed. Although the currently-proposed site locations have been moved slightly from those originally proposed, the distance is minor and would not alter the analysis.

3.3.4 Air Quality
This subsection would be changed so that the alterations in the site-design and construction plans, and the location, types, and amount of ground disturbing activities would be included in the analysis of impacts to air quality. Although the currently-proposed site locations have been shifted slightly from those originally proposed, the distance is minor and would not alter the analysis. The differences in the amount and types of disturbances from those discussed in the 2009 EA would be considered in the analysis of air quality.

3.3.5 Air Space
No changes needed. Although the currently-proposed site locations have been moved slightly from those originally proposed, the distance is minor and would not alter the analysis.

3.3.6 Noise
This subsection would need to be altered due to changes in noise-creating activities. This subsection would be changed so that the alterations in the site-design and construction plans, and the location, types, and amount of ground disturbing activities would be included in the analysis of impacts to noise levels. The 2009 EA states that equipment will be brought to the site by hand and that a walk-behind trencher would be used are no longer accurate. The reduction in the number of Core terrestrial and tower sites from three to one would reduce the amount of noise generated by the activities proposed. Although the currently-proposed site locations have shifted slightly from those originally proposed, the distance is minor and the difference in site locations would not alter the analysis. The differences in the amount and types of disturbances from those discussed in the 2009 EA would be considered in the analysis of impacts to noise levels.

3.3.7 Water Quality
Several changes would be needed. Several statements in this subsection of the EA are no longer correct. This subsection would be changed so that the alterations in the site-design and construction plans, and the location, types, and amount of ground disturbing activities would be included in the analysis of impacts to water quality. There would be less impervious surface area created due to the
implementation of activities (as fewer sites are currently-proposed). Equipment and materials would not be brought to the site by hand and therefore the transport utilizing motorized equipment could create greater ground disturbance than described in the 2009 EA. The amount of disturbance created due to construction would not be <0.01 ha at each of the currently-proposed locations, disturbance created during trenching efforts would result from a motorized trenching device rather than a walk-behind trencher. The greater amounts of disturbance would be mitigated utilizing the water quality-related best management practices outlined in subsection 2.2.2. As the EA originally analyzed the installation and operation of four sites rather than the two sites currently proposed, there would be fewer areas of disturbance resulting from site construction. Any indirect impacts to water quality would remain temporary and negligible and the potential for impacts to water quality from construction would end following the stabilization and revegetation of disturbed soils.

3.3.8 Wetlands
Small changes would be needed due to the relocation of the currently-proposed sites and the availability of new information regarding the lack of on-site wetlands at the currently-proposed site locations. It remains anticipated that, given the currently-proposed activities, no cumulative, direct, or indirect impacts to wetlands would be anticipated or likely.

3.3.9 Floodplains
Other than the reduction in the number of sites and the relocation of the currently-proposed sites, this subsection of the EA would remain mostly the same. This subsection would only be changed so that the alterations in the site-design, specifically the change in the amount of impervious surface area created, would be included in the analysis of impacts to floodplains. Although the currently-proposed site locations have been moved slightly from those originally proposed, the distance is minor and the difference in site locations would not alter the analysis.

3.3.10 Common Vegetation and Plant Communities
This subsection would be changed so that the alterations in the site-design and construction plans, and the location, types, and amount of ground-disturbing (and thus, vegetation-disturbing) activities would be included in the analysis of impacts to common vegetation and plant communities. A new report discussing a 2014 preconstruction vegetation survey also provides new information that would be included in the analysis of potential impacts to common vegetation and plant communities.

3.3.11 Common Fauna
This subsection would be changed so that the alterations in the site-design and construction plans, and the location, types, and amount of ground disturbing activities would be included in the analysis of impacts to common fauna. Wildlife common to the currently-proposed sites remains consistent with that described for the EA-sites C-32 and A-26 and to the Caddo-LBJ in general.

3.3.12 Sensitive Ecological Communities
The availability of new information and the changes in the project activities would have influenced
the analysis described in this subsection of the EA. The change in site locations and designs, the
change in the amount of and type of disturbance, and the type of equipment used would have been
factors considered in the 2009 EA analysis of impacts to sensitive ecological communities. New reports
describing vegetation and habitats at both the currently-proposed sites (Included in Attachments G and H)
would also be included in the analysis of impacts to sensitive ecological communities, as would
recent documentation of a U.S. Fish and Wildlife Service Section 7 concurrence with a “May affect, not
likely to adversely affect” federally-listed species (included in Attachment I). The 2009 EA stated that site
construction would impact high priority conservation areas of native prairie and grasslands, but that
the impact would be minimal due to the minimal amount of disturbance. The changes described above
for the currently-proposed activities would impact the analysis of sensitive ecological communities.
The analysis results are discussed in subsection 3.5.12.

3.3.13 Sensitive Species
The availability of new information and the changes in the project activities would have influenced
the analysis described in this subsection of the EA. The results of the original EA-analysis of impacts
to sensitive species were discussed in detail within the Domain-specific subsection of the EA (subsection
3.5.13). For the purposes of the 2009 EA-analysis, locations were reviewed for information on the presence
of sensitive species within an area represented by a radius of 5 km from each proposed tower location.
Where a sensitive species or its required habitat is known to occur in this area and the available data lack
the specificity to determine whether the occurrence is near enough to be impacted, NEON, Inc. would
conduct site-specific surveys in advance of any ground disturbance. Changes in the proposed activities,
new site-specific information regarding site vegetation, and the FWS list of federally-listed species
support a review of the original EA analysis and a new analysis of potential impacts to sensitive species.
The results regarding potential impacts to sensitive species are discussed in subsection 3.5.13.

3.3.14 Cultural Resources
The availability of new information and the changes in the project activities would have influenced
the analysis described in this subsection of the EA. This subsection would need to be changed due to
the changes in site locations and the completion of the National Historic Preservation Act “Phase 2“
obligations described in the 2009 EA. This subsection of the 2009 EA described that a phased approach
to cultural resource analysis and NHPA compliance would be utilized. The Phase 1 records and literature
review researched a 1.6-km radius area around the EA-analyzed sites. The currently-proposed
construction sites remain within the 1.6 km radius study area. As per the NHPA phased-approach
described in the 2009 EA, the NHPA Phase 2 site-specific cultural resource surveys would have been
completed after specific site locations were certain. As the currently-proposed sites have become the
desired locations for the NEON Core terrestrial and tower site and the aquatic array/aquatic site, the
Phase 3 cultural resource surveys have been completed and the results of those surveys are now available
to include in an analysis of potential impacts to cultural resources. The results of the EA analysis of
potential impacts to cultural resources and how the changes to the proposed activities and the newly
acquired information would impact that analysis are discussed in subsection 3.5.14.
3.3.15 Utilities
The analysis of utility-impacts would be altered due to the changes in the site-locations, site-designs, and construction activities (disturbance created due to the changes in the means of trenching for the placement of utilities). The location of the buried utilities at each site would need to be modified. Also, a change in the statement regarding the use of a walk-behind trencher would need to be made, as utility corridors would be installed utilizing motorized equipment. This would result in a greater area of disturbance at each of the currently-proposed sites. Other than the location and amount of disturbance required to install the utilities at both currently-proposed sites, no other changes would need to be made to this subsection. The results of the EA analysis of potential utility-impacts and how the changes to the proposed activities would impact that analysis are discussed in subsection 3.5.15.

3.3.16 Transportation
Given the changes in the site-locations and site-designs, new information regarding impacts to transportation would be included in the site-specific analysis.

3.3.17 Human Health and Safety
This subsection would remain the same.

3.3.18 Environmental Justice
This subsection would remain the same.

3.3.19 Protection of Children
This subsection would remain the same.

3.3.20 Recreation
Changes in the site-locations and site-designs would need to be included in the site-specific analysis of impacts to recreation. The results of the analysis of impacts to recreation are discussed in detail within the Domain-specific subsection of the EA. Since the writing of the 2009 EA, additional information regarding site-installation has been gained. Given the changes in the site-locations and site-designs, new information regarding impacts to recreation would be included in the site-specific analysis. The results of the EA analysis of potential impacts to recreation and how the changes to the proposed activities would impact that analysis are discussed in subsection 3.5.21.

3.3.21 Aesthetics and Visual Resources
Changes in the site-locations and site-designs would need to be included in the site-specific analysis of impacts to aesthetics and visual resources. Since the writing of the 2009 EA, additional information regarding site installation has been gained. Given the changes in the site-locations and site-design, new information regarding impacts to aesthetics and visual resources would be included in the site-specific analysis. The results of the EA analysis of potential impacts to recreation and how the changes to the proposed activities would impact that analysis are discussed in subsection 3.5.21.

3.4 Mobile Deployment Platforms
No changes needed. No MDPs are currently-proposed or anticipated and no MDPs were discussed in the 2009 EA for the Caddo-LBJ.

3.5 Domains
Changes in the site-locations, site-designs, and construction and operational activities, as well as the new availability of additional information would need to be included in the analysis documented within the 3.5 subsections. Subsections within the 3.5-portion of the 2009 EA documented the analysis and results of the impacts of the proposed activities on environmental resources.

3.5.11. Domain 11 Southern Plains
Changes in the site-locations, site-designs, and construction and operational activities, as well as the new availability of additional information would need to be included in the analysis documented within the 3.5 subsections.

3.5.11.1 Introduction
This subsection of the 2009 EA would need to be altered as the number of sites and the site locations depicted in the figures referenced do not accurately depict all the locations of the NEON sites that have been constructed or are currently planned. Only one Core terrestrial and tower site and one associated aquatic array/aquatic site are currently-proposed rather than the three Core terrestrial and tower sites and one associated aquatic array/aquatic site analyzed and discussed in the 2009 EA. The locations of the currently-proposed sites are very near two of the sites analyzed and discussed in the 2009 EA.

3.5.11.2 Resource Areas Considered But Not Addressed for Domain 11
No major changes needed. In the 2009 EA, the resource areas of Airspace, Protection of Children, and Aesthetics and Visual Resources were determined to not need additional considerations. The relocation of the two Caddo-LBJ sites shifts the sites further from roads or trails where they may be easily-viewed from Caddo-LBJ roads or trails. The changes in the currently-proposed activities from the actions originally analyzed would not alter the analysis of these resource areas.

3.5.11.3 Resource Areas Considered in Detail for Domain 11 (Caddo-LBJ Sites)
Needed changes to the following subsections result from project changes as described above (changes in the site numbers and locations, site and project components (including new soil survey component), changes in operation activities, and the availability of new information from post-2009-EA surveys, reports, and correspondence. The following EA-subsections described the affected environment and the anticipated environmental consequences for resource areas.

Geology
No changes needed.
Soils
Changes needed include corrections to the 2009 EA-estimates of soil disturbance required for site construction, the addition of greater soil-disturbance activities (use of motorized equipment), and the NEON soil survey site-component. Rather than the <0.1ha of disturbance resulting from site construction (as stated in the 2009 EA), 0.53 acres of disturbance would result from the Core terrestrial and tower site construction and 0.47 acres of disturbance would result from the aquatic array/aquatic site construction. Motorized equipment would be used to bring equipment and materials to and from the site, for drilling groundwater wells, and for trenching power and communications conduits. BMPs would be implemented to mitigate impacts to soils that may result from the new soil survey component.

Climate
No changes needed.

Air Quality
To accurately describe the currently-proposed activities, corrections would be needed for this subsection of the EA, but the environmental consequences to air quality resources would remain the same. Statements needing corrections include statements indicating (1) that equipment and materials would be brought to and from the sites by hand and (2) that the amount of ground disturbance would be under 0.01ha.

Noise
Several statements within this subsection are no longer accurate. The environmental consequences would be similar as those described in the EA. At each site there would be more noise disturbance created during construction (due to the additional uses of motorized equipment). The anticipated noise from the gas pumps in the instrument hut is less than previously discussed in the 2009 EA.

Water Quality
Several changes would be needed. Several statements in this subsection of the EA would need to be corrected. There would be less impervious surface area created due to the implementation of activities, equipment and materials would not be brought to the site by hand, and the amount of disturbance created due to construction would not be <0.01 ha at each of the currently-proposed locations. The impervious surface area created due to the currently-proposed activities is estimated at approximately 27.13 m², and not the 35 m² stated in the 2009 EA. Narrow-width equipment would be utilized to bring equipment and materials to and from the site during construction and site-removal. Trenching and ground well drilling would not be completed by hand-operated equipment, but by motorized equipment. Although these changes result in greater amounts of disturbance at each of the sites, fewer sites are currently proposed than were analyzed in the 2009 EA. BMPs would be utilized to mitigate short-term, indirect, and localized water quality impacts. Any indirect impacts to water quality would still be expected to be indirect, temporary, and negligible.
Wetlands
Small changes would be needed for this subsection due to the relocation of the currently-proposed sites and the availability of new information regarding the lack of on-site wetlands at the currently-proposed site locations. Since the writing of the 2009 EA, a wetland survey of the Core terrestrial and tower site was completed on February 7, 2013 (included herein as Attachment F). NEON staff have also prepared an aquatic site characterization report (dated December 18, 2014 and included as Attachment J) for the currently-proposed aquatic array/aquatic site. As stated in the 2009 EA, NEON, Inc. would implement appropriate BMPs, as described in Section 2.2.2, to minimize the potential for indirect impacts to wetlands as a result of erosion and sedimentation from the construction of sites. To avoid impacts to wetlands, BMPs would also be utilized at FSU/TOS plots during the new NRCS soil-pit sampling. It remains anticipated that, given the currently-proposed activities, no cumulative, direct, or indirect impacts to wetlands would be anticipated or be likely.

Floodplains
Other than the reduction in sites and the relocation of the currently-proposed sites, this subsection of the EA would remain the same. Floodplains in the LBJ are associated with various creeks and streams that flow throughout the area. The EA-proposed tower (C-32) would be located outside any nearby floodplains. The Aquatic Array (A-26) would be located in Pringle Creek within the floodplain (FEMA, 1990a). There would be negligible direct impacts to flood prone areas as a result of implementation of the currently-proposed NEON sites.

Common Vegetation and Plant Communities
Due to the changes in the number of terrestrial/tower sites, locations of the sites, site designs and components, and construction-related disturbances this subsection of the EA would need to be changed. Changes required would include discussing the site vegetation at the currently proposed sites and analyzing the impacts to that site vegetation given the changes to the currently proposed activities (including the greater amount of ground and thus vegetation disturbance from the currently proposed activities). Information obtained since the writing of the 2009 EA is also now available and would be included in the analysis of potential impacts to vegetation and plant communities. The 2009 EA stated that impacts to vegetation and plant communities would be negligible and short-term as NEON would implement the BMPs outlined in subsection 2.2.2 and potentially seed disturbed areas to minimize impacts to vegetation and plant communities. Although the areas of disturbance would be greater with the implementation of the currently-proposed activities, if BMPs are implemented and the vegetation in disturbed areas regrows naturally or through seeding efforts, the impacts would remain negligible and short-term.

Common Fauna
Due to the proposed project changes, several statements within this subsection of the EA would need to be altered. Due to the shift in site location and design, different habitats and different disturbances would occur at the currently proposed sites and with the currently proposed activities than were described in the 2009 EA. The changes described would only result in localized and mostly
short-term impacts. The impacts on common fauna resulting from operations would remain minimal. The sizes of the sampling plots are much smaller than those described in the 2009 EA and sampling protocols and BMPs would be implemented to minimize impacts to common fauna from operations.

Sensitive Ecological Communities
The changes in the proposed activities as described above would have influenced the analysis of potential impacts to sensitive ecological communities. The change in site locations and designs, the change in the amounts of and types of disturbances, the types of equipment used, and changes in operations and sampling protocols would have been factors considered in the 2009 EA analysis of impacts to sensitive ecological communities. Although a greater amount of disturbance is currently proposed than was analyzed in the 2009 EA, only a portion of the construction disturbances and the field operations (sampling efforts) would occur within sensitive grassland and prairie habitats, habitats of the black-capped vireo, or the mesquite habitats of the Texas Kangaroo Rat. Prior to construction of the terrestrial and tower site and the aquatic array/aquatic site, as well as the selection of sampling plots (tower and distributed), and the completion of the new soil surveying work, NEON would coordinate with USFS to avoid any sensitive habitats if applicable. As will be described below, the NSF and NEON have consulted with the FWS regarding the potential impacts to federally-listed species and their habitats.

Sensitive Species
The changes in site locations, site and project designs, the amounts and types of disturbances, and the availability of new information, are factors that would have been included in the analysis of sensitive species. The currently proposed activities have the potential to impact federal and state listed species as well as migratory birds and flying mammals. A concurrence with a “May affect, not likely to adversely affect” federally listed species has been obtained for the currently proposed activities (included as Attachment I).

Cultural Resources
Changes to this subsection would be needed due to changes in site locations, the addition of new ground disturbing activities, the changes in amount and types of ground disturbance, and the availability of new information that has been gained from intensive site-specific cultural resource surveys that were conducted in 2015 at the currently proposed sites. The State Historic Preservation Office and the US. Forest Service will be consulted to determine if mitigation measures would be required to avoid impacts to any of the newly-discovered resources.

Utilities
This subsection would be to correct to include a statement regarding the use of a walk-behind trencher. As BMPS outlined in subsection 2.2.2 would be implemented to avoid adverse impacts from the trenching of utilities, the environmental consequences to utilities would remain the same.
Transportation
Several statements within this subsection would need to be corrected due to the changes in the number, design, components, and location of the currently-proposed sites. Corrections to the 2009-EA statements would be: (1) motorized equipment would be required to transport equipment and materials to the site; (2) improved paths would be constructed not only for construction-activities but for site-access during operations; and (3) improved paths installed would not be restricted from public-access, but signage would be installed to inform the public that the site is a restricted area. Also, new design information is available that would have been included in this subsection; a short-term closure of a horse-trail during construction would be required and if necessary for safe site-access, improvements to an existing fire break/access road would be implemented (the addition of gravel and vegetation-maintenance). The construction and operation of the proposed sites would still have a negligible impact on local traffic and transportation. No potential for interaction with other projects would likely result. No cumulative traffic and transportation impacts would be expected.

Human Health and Safety
Several site-design changes regarding site-area fencing and flagging have been made that would need to be reflected in this subsection. The site locations would be further from roads and more isolated and the signage would be installed to discourage site entry. Impacts to human health and safety would likely remain negligible and not significant.

Environmental Justice
A few changes would need to be made to this section due to the alterations in the number, components, sizes of, and location of the currently proposed sites. It remains that no impacts to environmental justice would be expected.

Recreation
A few changes would need to be made to this section due to the alterations in the number, design, components, sizes of, and location of the currently proposed sites. The impacts to recreation would remain minor and be mostly temporary.

4.0 CONCLUSIONS
The below describes alterations in the conclusions described in the 2009 EA given the changes in the construction, operations, and closures of the Caddo-LBJ sites.

No effects
Given the changes to the currently proposed activities, the EA Conclusion indicating that NEON would have no effect on land use, topography, hydrogeology, demographics, and community resources would remain accurate. The EA stated that no groundwater would be taken and also concluded that there would be no effects to groundwater. Small amounts of groundwater would be taken during groundwater sampling efforts, there would be negligible impacts to groundwater from the drilling of wells and the sampling of groundwater.
**Minor short-term and long-term beneficial effects**
The changed project activities effects on demographics would remain the same as those described in the 2009 EA. There would be minor short-term and long-term beneficial impacts to the local economy of the areas where infrastructure would be placed through secondary spending by construction crews, maintenance technicians, and researchers.

**Negligible adverse impacts**

*Hydrology and Hazardous and Toxic Substances*
The changed project activities effects on hydrology and on hazardous and toxic substances would remain the same as those described in the 2009 EA. With the implementation of appropriate BMPs and project design features, impacts to hydrology and hazardous and toxic substances would remain less than significant.

**Less than significant impacts**
The EA Conclusions described that the implementation of the originally proposed activities would result in less than significant impacts to the following resources: geology, soils, climate, air quality, airspace, noise, water quality, wetlands, floodplains, common vegetation and plant communities, wildlife, sensitive ecological communities, sensitive species, cultural resources, utilities, transportation, health and safety, environmental justice, environmental health and safety of children, recreational opportunities, and aesthetics or visual resources. Given the changes to the currently proposed activities, this determination would remain the same given the BMPs and project design features and the agency coordination described herein are implemented and conducted to minimize impacts to these resources.

**Cumulative Impacts**
Given the changes in the proposed activities, the EA conclusion that no adverse cumulative impacts would occur during the operation of NEON remains an accurate expectation.

**Determination of Overall Project Impacts to Resources**
Changes to the currently proposed activities would not result in any changes to the EA’s determination of overall project impacts to resources. The 2009 EA Conclusion describes that the determination of the resource impacts potentially resulting from the implementation of the originally proposed activities was based on: (1) NEON’s implementation of design features and BMPs; (2) NEON’s compliance with all regulatory conditions from the permits that NEON would obtain; and (3) the future completion of site-specific data-acquisition and impact-analysis, followed by regulatory agency coordination and mitigation implementation (if needed to mitigate site-specific resource impacts).

**NSF Determination**
The EA conclusion stated “Based on the analysis in this EA, NSF has determined that implementation of NEON, with the condition that appropriate project design features and BMPs would be implemented as needed and additional agency coordination would be completed where necessary, would result in no significant adverse impacts to the natural or human environment.” The changes to the currently proposed
activities would not influence the NSF determination provided in the EA’s Conclusion.

5.0 PERMITTING REQUIREMENTS
Given the changes to the currently proposed activities, this section of the EA would remain the same. No changes to the permits that may be required would be necessary. The appropriate permits would still be obtained.
Figure 1. Map of Domains and sites from the 2009 NSF NEON EA (included therein as Figure 2-1).
Figure 2: Current Map of NEON Domains and Site Locations. The Special Use Permit permits requested by the applicant involve activities at two locations within the Caddo-LBJ. The Caddo-LBJ locations occur in the area denoted below as Domain 11 – Southern Plains.
Figure 3: The image below depicts the NEON Domain 11- The Southern Plains; the NEON Domain where the Caddo-LBJ Core Site and associated Aquatic Array/Site would be located (at the scale presented, the locations proposed in the 2009 EA and the currently proposed locations cannot be differentiated).
Figure 4. Locations within the Caddo-LBJ boundary where the currently proposed Core Tower Site and associate Aquatic Array/ Site would occur. The Caddo-LBJ Boundary is depicted in light greenish-yellow line, the proposed core tower site is depicted by the black-filled circle, and the aquatic array/site is depicted by the blue “water droplet” symbol.
Figure 5. Figure from the 2009 EA Section 2: Description of Proposed Action and Alternatives. Figure shows the Domain 11 Caddo-LBJ Terrestrial/ Core Tower Locations as presented in the 2009 EA’s Section 2.
Figure 6. Figure from the 2009 EA Section 2: Description of Proposed Action and Alternatives. The figure depicts the location of proposed aquatic array/aquatic site as presented in the 2009 EA.
Figure 7: The 2009 EA figure presented below, depicted the locations of proposed tower sites C-32 and C-33 as presented in the 2009 EA Section 3 Affected Environment. The sites depicted below were two of the three LBJ-tower sites proposed, analyzed, and discussed in the 2009 EA.
Figure 8. The 2009 EA figure presented below, depicts the location of proposed tower site C-31 as presented in the 2009 EA Section 3: Affected Environment. The site depicted below was one of the three LBJ-tower sites proposed, analyzed, and discussed in the 2009 EA.

The 2009 NSF NEON EA figure that depicted the locations of the other two (of the three) LBJ-tower sites (C-32 and C-33), tower sites also proposed, analyzed, and discussed in the 2009 NSF NEON EA, are provided on the preceding page.
Figure 9. Below is the figure from the 2009 EA’s Section 3: Affect Environment. The figure depicts the general location of the EA’s site A-26, the originally proposed Domain 11 LBJ Pringle Creek aquatic site/aquatic array.

The Special Use Permit applied for by NSF/NEON proposes a new location for the aquatic array. The new location is northwest of A-26.

The Special Use Permit applied for by NSF/NEON proposes the installation of only one tower site. The location of the tower site is located northwest of C-32.
Figure 10. Locations (indicated by blue “water droplets”) proposed (in the 2009 EA and in the current Caddo-LBJ Special Use Permit) for the NEON D11 Aquatic array/site on Pringle Creek. The location depicted to the north is the site currently proposed in the 2015 NSF/NEON Caddo-LBJ Special Use Permit. The location depicted to the south is the closest original aquatic location proposed in the 2009 NSF EA. The currently proposed location occurs approximately 1,300 feet or 0.25 miles to the northwest of the location proposed in the 2009 EA.

Figure 11. Locations (indicated by black-filled circles) proposed (in the 2009 EA and in the current Caddo-LBJ Special Use Permit) for the Core terrestrial and tower site. The location depicted to the north is the site currently proposed in the 2015 NSF/NEON Caddo-LBJ Special Use Permit. The location depicted to the south is the closest original tower location as proposed in the 2009 NSF EA. The currently proposed location occurs approximately 890 feet or 0.18 miles to the northwest of the location proposed in the 2009 EA.
Figure 12. 2009 NSF NEON EA Domain 11 Sensitive Species Tables

<table>
<thead>
<tr>
<th>NEON Facility Number</th>
<th>Number of Federal Protected Species Potentially Occurring</th>
<th>Number of State Protected Species Potentially Occurring</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>At or adjacent to Proposed Tower</td>
<td>Within 5 km of Proposed Tower</td>
</tr>
<tr>
<td>C-31</td>
<td>1-ESA</td>
<td>1</td>
</tr>
<tr>
<td>C-32</td>
<td>1-ESA</td>
<td>1</td>
</tr>
<tr>
<td>C-33</td>
<td>1-ESA</td>
<td>1</td>
</tr>
<tr>
<td>R-21</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>R-22</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>A-26</td>
<td>1-ESA</td>
<td>1</td>
</tr>
<tr>
<td>A-27</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

The table above, placed within the 2009 EA text, summarized the number of protected species potentially occurring at, adjacent to, or within 5km of each proposed site. At the time (2009), there was the potential for suitable habitat for two federally-protected species and one state-protected species at both C-32 and A-26, the two sites originally proposed that occur near the currently proposed locations.

The table below is a copy of the D11 Caddo-LBJ-portion of 2009 NSF NEON EA Appendix B. It includes a listing of and information about the protected species known to potentially-occur at each of the 2009 EA Caddo-LBJ proposed sites.

<table>
<thead>
<tr>
<th>Domain: Southern Plains</th>
<th>Domain Number: 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Site and Aquatic Site Names: C-31, C-32, C-33, A-26</td>
<td>Sensitive Species Within 5 km of the Proposed NEON Location</td>
</tr>
<tr>
<td>Protected / M/S / Sensitive Species or Habitats</td>
<td>Prot.: Federal</td>
</tr>
<tr>
<td>Texas Kangaroo Rat (Dipodomys elator)</td>
<td>EN</td>
</tr>
<tr>
<td>Black-capped Vireo (Vireo atricapillus)</td>
<td>EN</td>
</tr>
<tr>
<td>Bald Eagle (Haliaeetus leucocephalus)</td>
<td>EN</td>
</tr>
<tr>
<td>Myrmeleon Tortoise (Lumbricid toroicurus)</td>
<td>EN</td>
</tr>
<tr>
<td>Texas Turtles (Testudo palustris)</td>
<td>EN</td>
</tr>
<tr>
<td>Constrictor Green Snake (Dipsosaurus punctatus)</td>
<td>EN</td>
</tr>
<tr>
<td>American Bittern (Botaurus lentiginosus)</td>
<td>EN</td>
</tr>
<tr>
<td>Guadalupe Rock Pocket Mouse (Clethrionomys gapperi)</td>
<td>EN</td>
</tr>
</tbody>
</table>

Notes:
* Data from April 2008, personal communication
* State agency responsible for the Texas Inventory of Natural Areas.
* Federal categorical exclusions for the 1982 Fish and Wildlife Service.
* Federal categorical exclusions for the U.S. Fish and Wildlife Service.
* Federal Airport Regulatory

References:
Sanchez, A. Biodiversity at the National Land Use Database. 2009. Personal communication with CHW-HILL, February 17.
Smith, D. J. Texas Natural Diversity Database. 2008. Personal communication with CHW-HILL, December 23.
Figure 13. Below is a copy of the 2009 EA Section 3.5.11.14 Cultural Resources Table. The table displayed the number of previously-documented archaeological resources and historic resources found present within a 1.6 km study area at each of the four Caddo-LBJ site locations analyzed in the 2009 EA.

<table>
<thead>
<tr>
<th>NEON Site Number</th>
<th>Previously Surveyed</th>
<th>Number of Archaeological Resources Present</th>
<th>Number of Historic Resources, Including Architecture Present</th>
<th>Number Evaluated</th>
<th>Number Eligible</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-31</td>
<td>No</td>
<td>0 Within Area of Direct Impact of Proposed NEON Location</td>
<td>Multiple Historic farmsteads and debris scatters</td>
<td>0</td>
<td>n/a</td>
</tr>
<tr>
<td>C-32</td>
<td>No</td>
<td>0 Within Area of Direct Impact of Proposed NEON Location</td>
<td>1 Within 1.6-km Study Area and Historic homesteads</td>
<td>0</td>
<td>n/a</td>
</tr>
<tr>
<td>C-33</td>
<td>No</td>
<td>0 Within Area of Direct Impact of Proposed NEON Location</td>
<td>Historic homesteads</td>
<td>0</td>
<td>n/a</td>
</tr>
<tr>
<td>R-21</td>
<td>No</td>
<td>0 Within Area of Direct Impact of Proposed NEON Location</td>
<td>0 Multiple Historic farmsteads and debris scatters</td>
<td>0</td>
<td>n/a</td>
</tr>
<tr>
<td>A-26</td>
<td>No</td>
<td>0 Within Area of Direct Impact of Proposed NEON Location</td>
<td>Multiple Historic farmsteads and debris scatters</td>
<td>0</td>
<td>n/a</td>
</tr>
<tr>
<td>A-27</td>
<td>No</td>
<td>0 Within Area of Direct Impact of Proposed NEON Location</td>
<td>0 Multiple Historic farmsteads and debris scatters</td>
<td>0</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Source: Oklahoma Archaeological Survey, Texas Historical Commission, National Register Information System (NRIS). n/a = not applicable
Figure 14. The image below shows the currently proposed Core terrestrial/tower site “Tower Site”, along with 2009 EA sites C-32 and C-31 and the 1.6-km cultural resource literature assessment boundary for EA site C-32.
Figure 15. 2009 EA Cultural Resource Literature Review 1.6-km study area depicted along with nearest EA-analyzed site and currently proposed aquatic site/aquatic array.
Figure 16. Map depicting the area included in the 2015 cultural resources survey of the currently proposed Caddo-LBJ terrestrial and tower site.
Figure 17: Map depicting area included in the 2015 cultural resources survey of the currently proposed Caddo-LBJ aquatic array/site-location.

Cultural survey area depicted by yellow boundary around aquatic array/aquatic site construction and sampling areas.