

KENTUCKY TRANSPORTATION CABINET/DIVISION OF ENVIRONMENTAL ANALYSIS ECOLOGICAL STUDY FORMAT GUIDANCE AND ACCOUNTABILITY FORM

Baseline Prepared by: _____ <div style="text-align: center; margin-top: -10px;"> Author Firm </div>			
County:	Route:	Item No.:	
Description:			
Prime Consultant:			
Due Date:	Submittal Date:	Submittal Draft #:	Approval Date:

Instructions:

Baseline Prepared by: Name of author/firm that prepared the study. **County:** Name of county(ies) within which the project is located.

Route: Name of highway for which the project is intended. Include route designation and number as applicable (i.e. US 60, Winchester Rd.)

Item No.: Item number as it appears in the contract and Six Year Plan which corresponds with the project.

Description: Official description of the project as it appears in the Six Year Plan.

Prime Consultant: Name of the Phase I Design and Environmental Consultant (prime contract holder) for the project.

Due Date: Date that the project is due as agreed upon in contract negotiation.

Date of Submittal/Submittal Draft Number: Date of submittal and draft being submitted (1st, 2nd, 3rd) in appropriate sections.

Approval Date: Date baseline is approved by DEA (**DEA use only**).

For “Required” column: √ indicates all applicable areas of focus (**DEA’s responsibility**).

For “Completed” column: use **Y** for yes and **NA** for not applicable as necessary (**Consultant’s responsibility**).

For “DEA” Column: DEA will use √ for all areas that adequately address concerns, and “I” for those that are insufficient in coverage.

“Comment” page: Discuss supplemental information, guidance or instructions, if any, that required deviation from the checklist. Discuss all categories which contain “NA” in the “Complete” columns of this format. Comments regarding the content and format of this form and/or its applicability may also be submitted in the comments section.

“Commitments to be Implemented” page: Identify any commitments that are documented within the study. Specify the nature of the commitment, to whom it was or should be made, when the commitment should be enacted upon, etc.

“Mitigation and Special Issues” page: Identify mitigation measures that are specified within the report, if any. Also, identify any special issues that are addressed within the document that should be considered by the Project Team as it makes decisions regarding the project.

“Signature” page: Signatures of Prime Consultant and KYTC/DEA Environmental Project Manager/Reviewer will attest that the base study meets the requirements set forth in this checklist. Signatures of KYTC Project Manager and District Environmental Coordinator ensure that the findings of the report, including impacts to the project and mitigation measures have been presented to the project development team and are acceptable.

Completed form is to be delivered to KYTC with the document. Previous checklists for the document, or a copy thereof, shall be attached to the current checklist.

Required	Complete	DEA	CATEGORY
Insert check mark as appropriate			I. PROJECT DESCRIPTION
✓			• Discussion of the project location provided.
✓			• Discussion of the purpose and need of the project provided.
✓			• Discuss the proposed alternates and the amount of land each alternate will ultimately impact.
✓			• Discussion of the typical section for each alternate provided.
			II. CORRESPONDENCE WITH STATE AND FEDERAL AGENCIES
✓			A. United States Fish and Wildlife Service (USFWS) <ul style="list-style-type: none"> Coordinate with USFWS for identification of federally listed species with potential for occurring within the impact area of the proposed project.
✓			B. Kentucky Department of Fish and Wildlife Resources (KDFWR) <ul style="list-style-type: none"> Coordinate with KDFWR for a listing of species which may be located within the project area. Such elements may include state and/or federally listed threatened/endangered species. KDFWR listing of critical natural areas, wildlife management areas, and any information which may be useful for subsequent field surveys (i.e. location of hibernaculums, wetlands, and other exemplary ecological communities).
✓			C. Kentucky State Nature Preserves Commission (KSNPC) <ul style="list-style-type: none"> Coordinate with KSNPC for identification of state and federally listed species and state nature preserves that may be impacted by the proposed project.
✓			D. Kentucky Division of Water (KDOW) <ul style="list-style-type: none"> KDOW coordination for identification of significant aquatic resources such as Wild & Scenic Rivers, Outstanding Resource Waters, Municipal Water Intakes, groundwater recharge areas, karst aquifers, toxic pollutants, and water quality information.
✓			E. Kentucky Division of Forestry (KDOF) <ul style="list-style-type: none"> KDOF coordination for identification of state and national champion trees, and/or state forests that may be impacted by the proposed project.
✓			F. U.S. Forest Service (USFS) <ul style="list-style-type: none"> If the project is within a National Forest, consultation with the USFS will be needed to determine the level of work required to satisfy USFS.
✓			G. U. S. National Park Service (USNPS) <ul style="list-style-type: none"> If the project is within a National Park, consultation with the USNPS will be needed to determine the level of work required to satisfy USNPS.

Required	Complete	DEA	CATEGORY
			III. ENVIRONMENTAL SETTING
✓			A. Climate <ul style="list-style-type: none"> Length of growing season, average annual precipitation, average temperatures, etc.
✓			B. Physiography <ul style="list-style-type: none"> Discuss which physiographic region of Kentucky the project lies within.
✓			C. Topography <ul style="list-style-type: none"> Within the project area, discuss elevation ranges above sea level. A general description of the project area should also be included (i.e. steep side slopes, narrow ridges, broad bottoms, etc.).
✓			D. Geology <ul style="list-style-type: none"> Discuss the geology of the project area. Discuss any significant geologic features within the project area such as caves, karst plains, coal reserves, acid-yielding geology, cryptoexplosive structures, etc.
✓			E. Soils <ul style="list-style-type: none"> Discuss the soils occurring within the project corridor. Discuss "Highly Erodible" soils and "Hydric Soils" that may be impacted by the proposed project.
✓			F. Watershed <ul style="list-style-type: none"> Discuss the watershed or watersheds within the project area. For discussion purposes watersheds need to be broken into eight (8) digit and eleven (11) digit Hydrologic Unit Codes (HUC).
✓			G. Land Use <ul style="list-style-type: none"> Discuss land use within the project area (i.e. agricultural, forested, urban, cropland, pastureland, etc.). Estimate percentage of each land use impacted by the project.
✓			H. Floral Community <ul style="list-style-type: none"> Discuss the forest community or communities located within the project area as categorized by Lucy Braun's book, "Deciduous Forest of Eastern North America" published in 1950.

Required	Complete	DEA	CATEGORY
Insert check mark as appropriate			IV. METHODS
			A. Literature and Office Review
✓			<ul style="list-style-type: none"> Review of publications by various agencies. Agencies may include USFWS, KSNPC, KDFWR, KDOW, USFS, KGS, etc. Review of information published by academia, which may aid in the preparation of the document. Review of USGS topographic and geologic quadrangles and National Wetland Inventory maps. Contact recognized experts on ecological issues that may have surfaced during the coordination and literature review process.
✓			
✓			
✓			
			B. Aquatic Sampling Methods
✓			<ul style="list-style-type: none"> Methods for collecting aquatic species for KYTC projects will follow KDOW most current publication "Methods for Assessing Biological Integrity of Surface Water." USEPA's 1999 publication "Rapid Bioassessment protocols for Use in Wadeable Streams and Rivers" will need to be followed as well. Sample all stream crossings and possible channel changes. Sampling will include fish, mussels, macroinvertebrates, water quality, and physical characteristics of the stream. Sample all wetlands with suitable aquatic habitat. Areas may include, but are not limited to temporarily flooded wetlands, seasonally flooded wetlands, permanently flood wetlands, semipermanently flooded wetlands, emergent wetlands, oxbows, swamps, sloughs, etc. Sampling should follow KDOW 1993 publication "Methods for Assessing Biological Integrity of Surface Water." Discuss methods utilized to sample aquatic habitats. If the project area is within the Eastern Kentucky Coalfield Region, a sample of all 1st order and ephemeral streams using the sample sheets found in the USEPA's 1999 publication "Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers" will be required. Samples must include conductivity analysis. If the stream or streams are dry, collect the water after a rain event. This sampling will be required in addition to the sampling methods stated above.
✓			
✓			
✓			
✓			
			C. Terrestrial Sampling Methods
✓			<ul style="list-style-type: none"> Project area walked and visually surveyed for plant and animal species. Floral surveys conducted by recording all plants observed and/or collected within the project area during field surveys. Project area investigated for the presence of caves and/or rock shelters. Field investigations for plants conducted during the spring, summer and fall to provide an adequate analysis of the various floral communities within the project area.
✓			
✓			
✓			

Required	Complete	DEA	CATEGORY
Insert check mark as appropriate			C. Terrestrial Sampling Methods (continued)
✓			<ul style="list-style-type: none"> Faunal investigations include, but not limited to: overturning rocks, logs and other debris for evidence of amphibians, reptiles, snails and small mammals. Observing evidence such as roadkills, scat, tracks or bedding places. Searching discarded bottles for small mammal remains.
✓			<ul style="list-style-type: none"> Surveys conducted for avifauna.
✓			<ul style="list-style-type: none"> Bats sampled according to USFWS guidelines.
✓			<ul style="list-style-type: none"> Terrestrial habitat areas delineated, floral and faunal surveys conducted within each habitat type.
✓			<ul style="list-style-type: none"> Discuss methods utilized to sample terrestrial habitats.
			D. Wetland Sampling Methods
✓			<ul style="list-style-type: none"> Local county soil survey, NWI maps, aerial photographs, USGS topographic maps used to determine potential wetland habitats within the project area.
✓			<ul style="list-style-type: none"> On-site wetland determinations conducted using the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual.
			E. State and Federal Threatened/Endangered Species Sampling Methods
✓			<ul style="list-style-type: none"> Evaluate habitat for state and federally threatened/endangered species within the project area.
✓			<ul style="list-style-type: none"> Sampling for federally listed threatened/endangered species completed according to guidelines established by USFWS within the "Recovery Plan" for each species listed for the project area.
✓			<ul style="list-style-type: none"> Sampling for state listed threatened/endangered species completed according to recommendations made by KDFWR and/or KSNPC.
			V. SAMPLING RESULTS
			A. Literature and Office Review Results
✓			<ul style="list-style-type: none"> Results from historical data, literature and office review. Results may include such elements as NWI listed wetlands, unique geologic features, endangered species locations, unique ecological habitats, etc.

Required	Complete	DEA	CATEGORY
Insert check mark as appropriate			B. Aquatic Sampling Results
			1. Macroinvertebrates
✓			<ul style="list-style-type: none"> • If unable to sample macroinvertebrates, discuss why. • Establish baseline conditions (append species collected and include location of sample sites). • Identify macroinvertebrates to species if possible. Otherwise, genera identification is sufficient. • Discuss EPS richness and provide MBI for each sampled body of water. • If available, compare results to historical data.
✓			
✓			
✓			
✓			
			2. Fishes
✓			<ul style="list-style-type: none"> • If unable to sample fishes, discuss why. • Establish baseline conditions (provide table of species collected and include location of sample sites). • Identify all fish to species. • Calculate IBI for each sampled body of water. • If available, compare results to historical data.
✓			
✓			
✓			
✓			
			3. Mussels
✓			<ul style="list-style-type: none"> • If unable to sample mussels, discuss why. • Establish baseline conditions (provide table of species collected and include location of sample sites). • Identify all mussels to species. • If available, compare results to historical data.
✓			
✓			
✓			

Required	Complete	DEA	CATEGORY
Insert check mark as appropriate			4. Water Quality
✓			• If unable to sample water quality, discuss why.
✓			• Establish baseline conditions (existing water quality, include tables, location of sample sites, etc.).
✓			• Discuss physical characteristics for sample area using data sheets found in the 1999 EPA publication "Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers" A-5.
✓			• Discuss physical parameters collected. Parameters included color, turbidity, air and water temperatures, conductivity, and stream discharge.
✓			• Discuss chemical parameters such as acidity/alkalinity, chloride, carbon dioxide, hardness, iron, ammonia nitrogen, dissolved oxygen, pH, sulfate and orthophosphate.
			C. Terrestrial Sampling Results
			1. Floral Surveys
✓			• Discuss plants observed and/or collected during field surveys.
✓			• Discuss any unique plants that may have been observed during field surveys.
			2. Faunal Surveys
✓			• Discuss results from faunal surveys.
✓			• Discuss any unique faunal species observed during field surveys.
			3. Terrestrial Habitats
✓			• Discussion of each terrestrial habitat located within the project area. Discussion needs to include the major floral and faunal components of each habitat, functional assessment of each habitat, etc.
✓			• Compare sample results with historical data.

Required	Complete	DEA	CATEGORY
Insert check mark as appropriate			D. Wetland Sampling Results
✓			<ul style="list-style-type: none"> The Cowardin Wetland Classification for each wetland within the project area provided. Discuss all wetlands in terms of biological significance and/or function regardless of jurisdiction. Separate wetlands that are Jurisdictional or Non-jurisdictional according to the USACE field verification. Discuss each Non-jurisdictional wetland within the project area and its role in the existing landscape. Acreage of each Non-jurisdictional wetland provided. Discuss each Jurisdictional wetland within the project area and its role within the existing landscape. Acreage of each Jurisdictional wetland provided.
✓			
✓			
✓			
✓			
✓			
✓			
			E. State and Federal Threatened/Endangered Species Sampling Results
✓			<ul style="list-style-type: none"> Results from surveys conducted for state and/or federally threatened/endangered species provided. Discuss potential habitat for state and/or federal threatened/endangered species that is located within the project area. Acreage of state and/or federal threatened/endangered species habitat present within the project area. Habitat broken down by each species (Indiana bat habitat, running buffalo clover habitat, gray bat habitat, etc.).
✓			
✓			
			VI. IMPACTS AND SUGGESTED MITIGATION MEASURES
			A. Significant Ecological Resources
			1. Impacts
✓			<ul style="list-style-type: none"> Impacts to Significant Ecological Resources provided. Significant Ecological Resources are issues that may have surfaced during the Correspondence with State and Federal Agencies phase and/or the Literature and Office Review phase. Such impacts may include KDFWR WMA, State and/or National Champion trees, a unique geological feature, Outstanding Resource Water, KDOW Special Use Waters, etc.
			2. Suggested Mitigation Measures
✓			<ul style="list-style-type: none"> Suggested mitigation measures provided.

Required	Complete	DEA	CATEGORY
Insert check mark as appropriate			B. Aquatic Ecosystem
			1. Impacts
✓			• Discuss cumulative and indirect impacts to the Aquatic Ecosystem.
✓			• Compare results with historical data and evaluate anticipated project effects on the existing and future conditions.
✓			• Discuss impacts of each alternate on the aquatic ecosystem.
			2. Suggested Mitigation Measures
✓			• Suggested mitigation measures provided.
			C. Streams
			1. Impacts
✓			• All streams listed by impacts (culvert, channel change, bridge).
✓			• Determine stream order of each stream impacted by the project (1 st order, 2 nd order, etc. as well as designating each stream as perennial, intermittent, ephemeral, etc.
✓			• Drainage area will be calculated for watershed area above each impact site.
✓			• Length of disturbance determined for each stream impacted by a culvert, channel change, and/or bridge.
			2. Suggested Mitigation Measures
✓			• Discuss potential mitigation measures (DEA will ultimately be responsible for the mitigation of stream impacts as they pertain to permits).
			D. Terrestrial Ecosystem
			1. Impacts
✓			• Discuss impacts to the floral community within the project area. Identify any unique plants which may be impacted by the proposed project.
✓			• Discuss impacts to the faunal community within the project area. Identify any unique faunal species which may be impacted by the proposed project area.

Required	Complete	DEA	CATEGORY
Insert check mark as appropriate			1. Impacts (continued)
✓			<ul style="list-style-type: none"> Discuss impacts to each terrestrial community located within the project area. Identify any unique terrestrial communities impacted by the proposed project.
✓			<ul style="list-style-type: none"> Discuss impacts of each alternate on the terrestrial ecosystem.
			2. Suggested Mitigation Measures
✓			<ul style="list-style-type: none"> Suggested mitigation measures provided.
			E. Wetlands
			1. Impacts
✓			<ul style="list-style-type: none"> Impacts of Jurisdictional Wetlands field verified by the USACE.
✓			<ul style="list-style-type: none"> Amount of Jurisdictional Wetlands, in acres, impacted by each alternate of the project.
✓			<ul style="list-style-type: none"> Impacts to each Jurisdictional Wetland, in acres, provided.
✓			<ul style="list-style-type: none"> Amount of Non-jurisdictional Wetlands, in acres, impacted by each alternate of the project.
			2. Suggested Mitigation Measures
✓			<ul style="list-style-type: none"> Discuss mitigation only in general terms: include any prior converted cropland that may be present along the project alternates or in the general area of the project. Consult KYTC/DEA on available wetland mitigation bank options.
			F. State and Federal Threatened/Endangered Species
			1. Impacts
✓			<ul style="list-style-type: none"> Discuss impacts to state and/or federal threatened/endangered species as a result of the project.
✓			<ul style="list-style-type: none"> Discuss impacts to state and/or federal threatened/endangered species habitat within the project area.
✓			<ul style="list-style-type: none"> Discuss impacts of each alternate on state and/or federal threatened/endangered species.
✓			<ul style="list-style-type: none"> Discuss impacts of each alternate on state and/or federal threatened/endangered species habitat.

Required	Complete	DEA	CATEGORY
Insert check mark as appropriate			2. Suggested Mitigation Measures
✓			<ul style="list-style-type: none"> Suggested mitigation measures provided.
			VII. SHORT TERM USE VERSUS LONG TERM PRODUCTIVITY
✓			<ul style="list-style-type: none"> Discuss in general terms the proposed project's relationship of local short-term impacts and use of resources, and the maintenance and enhancement of long-term productivity.
			VIII. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES
✓			<ul style="list-style-type: none"> Discuss in general terms the project's irreversible and irretrievable commitment of resources.
			IX. ALTERNATE ANALYSIS AND RECOMMENDATIONS
✓			<ul style="list-style-type: none"> Discuss the potential impacts of each alternate on the overall ecological community within the project area.
✓			<ul style="list-style-type: none"> Based on the overall impacts of each alternate, choose the alternate that will minimize the impacts to the overall ecological community.
			X. SUMMARY
✓			<ul style="list-style-type: none"> Summary of the project included in the report.
✓			<ul style="list-style-type: none"> Summary includes list of mitigation measures that will minimize impacts of the project as well as the preferred alternate from an ecological perspective.
			XI. REFERENCES
✓			<ul style="list-style-type: none"> References provided within the report.
			XII. TABLES
			A. Project Limits
✓			<ul style="list-style-type: none"> Table showing the total amount of land (in acres) impacted by each alternate of the project.
			B. Significant Ecological Resources
✓			<ul style="list-style-type: none"> Table showing each Significant Ecological Resource impacted and the amount impacted by each alternate.

Required	Complete	DEA	CATEGORY
Insert check mark as appropriate			C. Aquatic
✓			<ul style="list-style-type: none"> Table of Macroinvertebrates species collected. MBI for each sampled body of water included. Table of Fish species collected. IBI for each sampled body of water included. Table of Mussels collected. Tables of Water Quality analysis provided. Table showing each alternate's impact on the aquatic ecosystem.
✓			
✓			
✓			
✓			
✓			
✓			
			D. Streams
✓			<ul style="list-style-type: none"> All streams listed by impact (culvert, channel change, bridge) per alternate. Table showing stream order of each stream impacted by the project (1st order, 2nd order, etc. as well as designating each stream as perennial, intermittent, ephemeral, etc.). Table showing the calculated drainage area for the watershed area above each impact site. Table showing the length of disturbance determined for each stream impacted by a culvert, channel change, and/or bridge.
✓			
✓			
✓			
			E. Terrestrial
✓			<ul style="list-style-type: none"> Table showing a list of floral species observed and/or collected and the habitat/habitats they were found to occur within.
✓			<ul style="list-style-type: none"> Table showing a list of faunal species observed and/or collected and the habitat/habitats they were found to occur within.
✓			<ul style="list-style-type: none"> Table showing each terrestrial habitat type within the project area and the acreage impacted by each alternate.
			F. Wetlands
✓			<ul style="list-style-type: none"> Table showing the total acreage of each jurisdictional wetland and the impacted acreage of each jurisdictional wetland.
✓			<ul style="list-style-type: none"> Table showing each alternate and the total amount of jurisdictional wetland impacted by each alternate.

Required	Complete	DEA	CATEGORY
Insert check mark as appropriate			G. State and Federal Threatened/Endangered Species
✓			• Table showing state and federal threatened/endangered species listed for the project.
✓			• Table showing the amount of each state and federal threatened/endangered species habitat impacted by each alternate.
			XIII. EXHIBITS
			A. Project Limits
✓			• A topographic map of the project area with Right-of-Way (ROW) limits for each alternate delineated on the map.
✓			• A soils map of the project area with the ROW limits for each alternate delineated on the map.
✓			• An aerial photograph of the project area with the ROW limits for each alternate delineated on the map.
			B. Significant Ecological Resources
✓			• A topographic map of the project area with the Significant Ecological Resources and the ROW limits delineated on the map.
			C. Aquatic
✓			• Macroinvertebrate sampling sites, fish sampling sites, mussel survey sites, and water quality analysis locations delineated on a topographic map showing the ROW limits.
✓			• Photographs of each aquatic-sampling site provided.
			D. Streams
✓			• Stream impacts located on topographic map with the ROW limits delineated on the map.
✓			• Photographs of each stream impact site provided.
			E. Terrestrial
✓			• Floral and faunal sampling sites located on a topographic map with the ROW limits delineated on the map.
✓			• Photographs of each terrestrial sampling site provided.
✓			• Terrestrial habitats delineated on a topographic map with the ROW limits for each alternate.
✓			• Terrestrial habitats delineated on an aerial photograph with the ROW limits for each alternate.

Required	Complete	DEA	CATEGORY
Insert check mark as appropriate			F. Wetlands
✓			• Jurisdictional wetlands delineated on a topographic map with the ROW limits for each alternate.
✓			• Jurisdictional wetlands delineated on an aerial photograph with the ROW limits for each alternate.
✓			• Photographs of each jurisdictional wetland provided.
✓			• Non-jurisdictional wetlands delineated on a topographic map with the ROW limits for each alternate.
✓			• Each jurisdictional wetland surveyed and placed on the preliminary plan sheet for each alternate.
			G. State and Federal Threatened/Endangered Species
✓			• Sampling sites for all state and federal threatened/endangered species located on topographic map with ROW limits for each alternate.
✓			• Photographs for each state and federal threatened/endangered species sampling site provided.
✓			• Habitat for each state and federal threatened/endangered species delineated on a topographic map with ROW limits for each alternate.
✓			• Habitat for each state and federal threatened/endangered species delineated on an aerial photograph with ROW limits for each alternate.
			XIV. APPENDICES
✓			• Coordination letters and coordination response letters from all resource agencies enclosed.
✓			• Field data sheets provided (data sheets include routine wetland determination forms, data sheets, "A-5", found in the EPA publication "Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers," aquatic sampling data sheets, terrestrial sampling data sheet, etc.).
✓			• Laboratory data sheets provided.

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SIGNATURE PAGE

I have reviewed the project documentation and attest that those responsible for its preparation are familiar with the requirements set forth in the checklist above and that proper management controls were in effect throughout the course of document development to assure that the document is complete, thorough and addresses all applicable checklist components.

Prime Consultant

Date

Recommended for Approval By:

KYTC/DEA Environmental Project Manager/Reviewer

Date

Team Review of Commitments

The findings of the report, including impacts to the project and project commitments, have been presented to the Project Team and will be considered during the development of this project.

KYTC/District Environmental Coordinator

Date

Project Manager

Date