INTERAGENCY COORDINATION TOOL (ICT) HANDBOOK

A handbook for implementation of the ICT and compliance with the Endangered Species Act and the Bald and Golden Eagle Protection Act for West Virginia NRCS employees.

June 2012

ICT Version 1.0

IN COOPERATION WITH:

United States Department of Interior Fish and Wildlife Service

West Virginia Division of Natural Resources

WV GIS Technical Center, WVU Department of Geology & Geography

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I. INTRODUCTION

NRCS has the distinction of providing technical and financial assistance to landowners through voluntary participation in various programs. NRCS also has a responsibility, as an agency of the federal government, to uphold the laws and regulations of the government and to protect the interests of the public. With the assistance of NRCS, landowners can apply conservation alternatives that avoid adversely affecting protected species or their habitats, or proactively create or enhance habitat. An awareness of habitat locations and an understanding of the impacts of conservation practices, including the long and short-term effects on habitat, are key to NRCS being able to fulfill its responsibilities under the ESA.

This handbook outlines the standard operating procedures for use and application of the Interagency Coordination Tool (ICT). The ICT is a web-based geospatial computer application located on the internet at: http://www.mapwv.gov/ict. The tool is used to determine the probability of presence of designated habitat for federal listed species and impact avoidance based on predetermined avoidance measures approved through a programmatic consultation agreement.

The concept of the ICT was born out of the need to streamline and simplify the compliance process for Natural Resources Conservation Service (NRCS) field offices. Compliance with the Endangered Species Act was difficult in the field for many reasons including the lack of a cohesive process, the lack of species information, knowledge of the habitat and life history and reluctance by State and Federal agencies to share location or other information concerning their status.

Programmatic agreements with the U.S .Fish and Wildlife Service (USFWS) throughout the country paved the way for expedited methods to be developed that allowing field planners the ability to obtain a recipe for avoidance; thus aiding the recovery of species without having to consult with the USFWS on each occurrence. Most States that developed programmatic agreements also developed a conservation practice-species matrix that outlined necessary protocols when a particular practice affected the habitat of that species. Most programmatic agreements relied on the conservation planners to have access to location information, population and other data that was not readily available in West Virginia. These included maps or GIS layers that required staff time and personnel to maintain, update and manage.

The agencies in West Virginia responsible for safeguarding the natural heritage information were very concerned about dispensing locations of species of concern or otherwise listed species. There were concerns that the dispersal of this information could lead to people misusing the data thorough unauthorized specimen collection, development or project obstruction, eradicating the species from private property and so forth. On the other hand, this made it extremely difficult for resource agencies including NRCS to aid in the recovery efforts or even track potential benefits to these species or habitats as outlined in the NRCS mission. Conversely, NRCS had some concerns regarding the transfer of landowner information relevant to a client's conservation plan. Client's information concerning the decisions they make on their land is private information and must not be released except with written consent from the landowner.

Through partnership with the USFWS West Virginia Field Office and the West Virginia Division of Natural Resources (WVDNR), a programmatic consultation for the federal-listed species that could be encountered during planning and other non-project activities was developed. During this process, all conservation practices in West Virginia were reviewed for their potential effects on all current federal-listed species in the State. Determinations were made as to whether the practices were likely to have no effect, an adverse affect, or a beneficial effect, and in the cases of potential adverse effects, how those effects could be avoided.

However, this programmatic agreement did not fully solve the problem regarding the release of "sensitive" information by either agency nor did NRCS staff have access to location or habitat information. The idea of a

"black box" method where only minimal information may be offered from the inquiring to the receiving agency was developed. This method would allow only nominal non-sensitive information within a predetermined area to be entered into a website. In return, the website would generate strategies to avoid and minimize impacts to species or designated habitat without identifying the exact location or other sensitive information about the species. The resulting information would be based on the programmatic agreement. Above all, this method would allow agencies to identify specific instances where conservation practices would or could potentially benefit a listed species and move it toward delisting.

This method not only solved the privacy and sensitive species information issues, but also saved time and maintenance requirements by allowing one agency to maintain a single copy of geospatial maps and security needs within house. It avoided maintenance problems with maps and polygon layers and CEC compatibility issues for computer software. In addition, this method lends itself well to other applications including Cultural Resources and the Clean Water Act. Additional modules of this sort could be added to the ICT in relatively quick timeframes.

The ICT was designed to provide reports based on a number of criteria. First, the user identifies an area of interest and inputs conservation practices and the extents of those practices. The ICT then compares this data to other databases of information which include known locations of species, the potential impacts of practices, habitat suitability and agreed upon avoidance measures and requirements. The program then provides a printable report to the end user which outlines a conservation and avoidance strategy.

This handbook refers to version 1.0 of the ICT. It will be modified as the ICT evolves to reflect updates and future versions. It is anticipated that this information will be available for download from the ICT website in a printable format and distributed to field staff electronically.

It should be understood that the evolution of this tool will dictate the results to some degree. Every effort has been made to predict frequently encountered situations in which conservation practices would be utilized in various habitats. However, it is impossible to predict every situation. Therefore, the ICT will change and strategies will be revised over time. As with any software, versions 2.0 will be improvements beyond version 1.0 and so forth. This handbook does not constitute NRCS policy but outlines methodology to comply with NRCS policy in the appropriate General Manual Sections dealing with ESA compliance and NEPA.

II. RELEVANT STATUTES AND NRCS POLICY

NEPA

Departmental and NRCS policy for complying with NEPA establishes the process by which NRCS field offices will conduct an Environmental Evaluation to determine the potential effects of alternative solutions to resource problems for all planning activities and document the results of the evaluation on the CPA-52, "Environmental Evaluation Worksheet" including the appropriate finding.

The National Environment Policy Act (NEPA) was passed by Congress in 1969 and signed into law on January 1, 1970. NEPA makes Federal agencies accountable to the public for the environmental impacts of their actions. The Council on Environmental Quality (CEQ) has written regulations that establish the procedures NRCS and other Federal agencies must follow to meet NEPA requirements. These regulations require Federal agencies to follow a systematic process when a Federal action is proposed. Federally listed species is one of several categories the Natural Resources Conservation Service (NRCS) must evaluate for impacts.

ENDANGERED SPECIES ACT (ESA)

Section 7a(2) of the Endangered Species Act (ESA) of 1973 requires NRCS, in consultation with and with the assistance of the Secretary of the Interior, to insure that its agency actions and activities do not jeopardize the continued existence of threatened and endangered species or result in the destruction or adverse modification of the species' critical habitat. The Services designate the extent and location of a particular species' critical habitat. Critical habitats identify areas essential to the conservation of federally listed species. The NRCS policy for federally listed species can be found in the General Manual 190 Part 410.22 and the National Planning Procedures Handbook section 600.45. It states that NRCS will assist in the conservation of threatened and endangered species and consistent with legal requirements, avoid or prevent activities detrimental to such species. In addition, the ESA states that NRCS will use its authorities in furtherance of the purposes of this Act by carrying out programs for the conservation of listed species.

NRCS policy cited above does not apply to HELC and WC planning. For HEL and WC planning only, NRCS should inform the landowner if protected species may be impacted and continue to provide planning assistance. The landowner is responsible for obtaining any permits.

BALD AND GOLDEN EAGLE PROTECTION ACT (BGEPA)

In 1782 the Continental Congress adopted the bald eagle as a national symbol. During the next one and a half centuries, the bald eagle was heavily hunted by sportsmen, taxidermists, fisherman, and farmers. In 1940, to prevent the species from becoming extinct, Congress passed the Bald Eagle Protection Act (BGEPA). In 1962, Congress amended the Eagle Act to cover golden eagles, a move that was partially an attempt to strengthen protection of bald eagles, since the latter were often killed by people mistaking them for golden eagles. Another 1962 amendment authorizes the Secretary of the Interior to grant permits to Native Americans for traditional religious use of eagles and eagle parts and feathers. The Act was extremely comprehensive, prohibiting the take, possession, sale, purchase, barter, or offer to sell, purchase, or barter, export or import " of any bald or golden eagle, alive or dead, including any part, nest, or egg, unless allowed by permit (16U.S.C 668(a); 50 CFR 22). The Bald Eagle was "delisted" by the Service in July of 2007; however the species is still under protection of the Bald and Golden Eagle Protection Act of 1940.

PRIVACY INFORMATION

Client records are confidential except for those that are subject to the Freedom of Information Act. NRCS policy on the Freedom of Information Act and the Privacy Act are contained in National Instruction 120-310 and General Manual 120, Part 408.

Section 1619 of the Farm Bill prohibits the Secretary of Agriculture and its employees from disclosing certain information that has been provided by agricultural landowners and producers to participate in the U.S. Department of Agriculture's (USDA) programs, except as necessary for delivering technical assistance.

This section also prohibits the release of information that falls into certain categories. Information that has been provided to USDA by an agricultural producer or owner of agricultural land concerning the operation, practices, or the land itself in order to participate in USDA programs is not to be disclosed by any USDA employee. Geospatial information is also prohibited from disclosure when it has been maintained by the Secretary and concerns the land which an agricultural producer or owner has provided information to participate in a USDA program.

Information that has been provided to NRCS by an agricultural producer to participate in an NRCS program includes information directly provided to an NRCS employee, or information developed by the Agency based on information obtained from the property of the producer. An example of documents that may be withheld under Section 1619 include, but are not limited to, conservation plans, wetland determinations, Highly Erodible Land Determinations, acreage amounts, assistance notes, National Resources Inventory point data, flood damage surveys, and program contract information.

Geospatial information includes maps, surveys, and charts. Aerial photographs may be considered geospatial information only if they contain data identifying characteristics of the agricultural land. Section 1619 provides a limited release of information that would be otherwise protected as previously noted. Provided that USDA determines information will not be subsequently discussed, the Secretary is authorized to disclose information that has been provided by an agricultural producer or owner to a person, Federal, State, local, or tribal agency working in cooperation with USDA when technical or financial assistance is being provided to the agricultural operation or when responding to a disease or pest threat to an agricultural operation. Providing technical and financial assistance includes evaluation of programs, conservation practices, and outreach for USDA programs.

Additionally, Section 1619 provides that the prohibition on disclosure is not applicable to the disclosure of payment information, which includes the names and addresses of recipients of payments, under any USDA program. Furthermore, Section 1619 does not apply to information that has been transformed into a statistical or aggregate form that protects the name of an agricultural producer or owner or protects the site of gathering data. Consent of the producer or owner of the agricultural operation may be given as an additional exception to the prohibition on disclosure. Consent of the producer or owner of the agricultural operation must be provided in writing and include the name of the participant, which information is to be released, to whom the data is to be released, and the length of time the data is to be available for release. Consent, however, may not be given as a condition to participate in or receiving any benefit under a program administered by USDA.

Therefore, the reports generated by the ICT are non-transferable and are the sole property of the landowner because they include geospatial information and information used to participate in USDA programs. Reports are considered private and confidential. No release of the report information should occur to third parties unless authorized by the landowner in writing and the reports are not available through the Freedom of Information Act. A copy of the MOA signed by the three agencies involved with the ICT is included in the exhibits section of this document to reference the data sharing agreed to by all parties.

III. GETTING STARTED WITH THE ICT

HOW THE INTERAGENCY COORDINATION TOOL (ICT) FUNCTIONS

The programmatic consultation and resulting conservation practice-species matrix found in the document entitled *West Virginia NRCS Conservation Practice Effects on Threatened, Endangered, Candidate and Eagle Species for Planning and Program Implementation* is the foundation of the Interagency Coordination Tool (ICT). This material is used to form the final determination that the ICT provides. The ICT is a web-based geospatial application maintained by the WVDNR Wildlife Diversity and Natural Heritage Program and developed by the West Virginia University GIS Technical Center.

Users outline an area of interest and enter planned practices. Conservation planners receive information on impacts (both beneficial and adverse) and avoidance strategies based on that information. The ICT performs this task by running an initial analysis comparing listed resources within a predetermined distance. The ICT then runs several subsequent tests in other data layers to determine habitat suitability. At the end of the process a list of species that are likely to exist are produced. The tool then returns results of potentially listed species in one of three ways:

1. Any known populations which intersect or within a specified distance of an area of interest (AOI)
2. Any known habitats that are within or near the AOI
3. Any value over a certain threshold on any available site suitability model within or near the AOI

This information is then compared to the conservation practice-species matrix database in which recommendations are formed to provide final avoidance and management recommendations depending upon practices selected. Once these tests are performed the program then creates a report and notifies the user that the results are ready to be viewed. An email is sent to the user at which point can log into the program and view, save or print the report.

The report generated is proof of compliance with the Endangered Species Act. The information regarding benefits or potential impacts may be utilized to document avoidance or benefit to a particular species. It is important to realize that a report indicating a species may be affected by practice installation does not necessarily indicate that the species is present or even in close proximity to the area of interest. This threshold of suitability is based upon number of statistical factors and the best professional judgment from the US Fish and Wildlife Service, WV Division of Natural Resources and the Natural Resources Conservation Service biologists.

Conversely, a report indicating that here are no known listed species affected by the conservation practices chosen does not necessarily indicate an absence of listed species. This simply means that there are no known occurrences or the likelihood is extremely low for any listed species to be present and is not likely to be affected by the selected practices. The information provided in the ICT report is based on the best current data available to the USFWS and the WVDNR. Errors or gaps in information and data can occur; therefore planners should always check the site to determine suitability of habitat through on-site analysis and best professional judgment. Responses provided by the ICT indicating the absence of species of interest may indicate that the area has not been surveyed or on-site data, rather than confirmation that the area lacks critical habitat or species. Verification of the report information should always be performed on site.

REGISTERING AN ACCOUNT IN THE ICT

This section of the handbook describes the correct procedure to register an account, perform a query, generate a report and interpret the results of that report.

STEP 1 - Open the link below and click the "*Register*" link on the left side of the page under the login box (Fig.1).

http://www.mapwv.gov/ICT

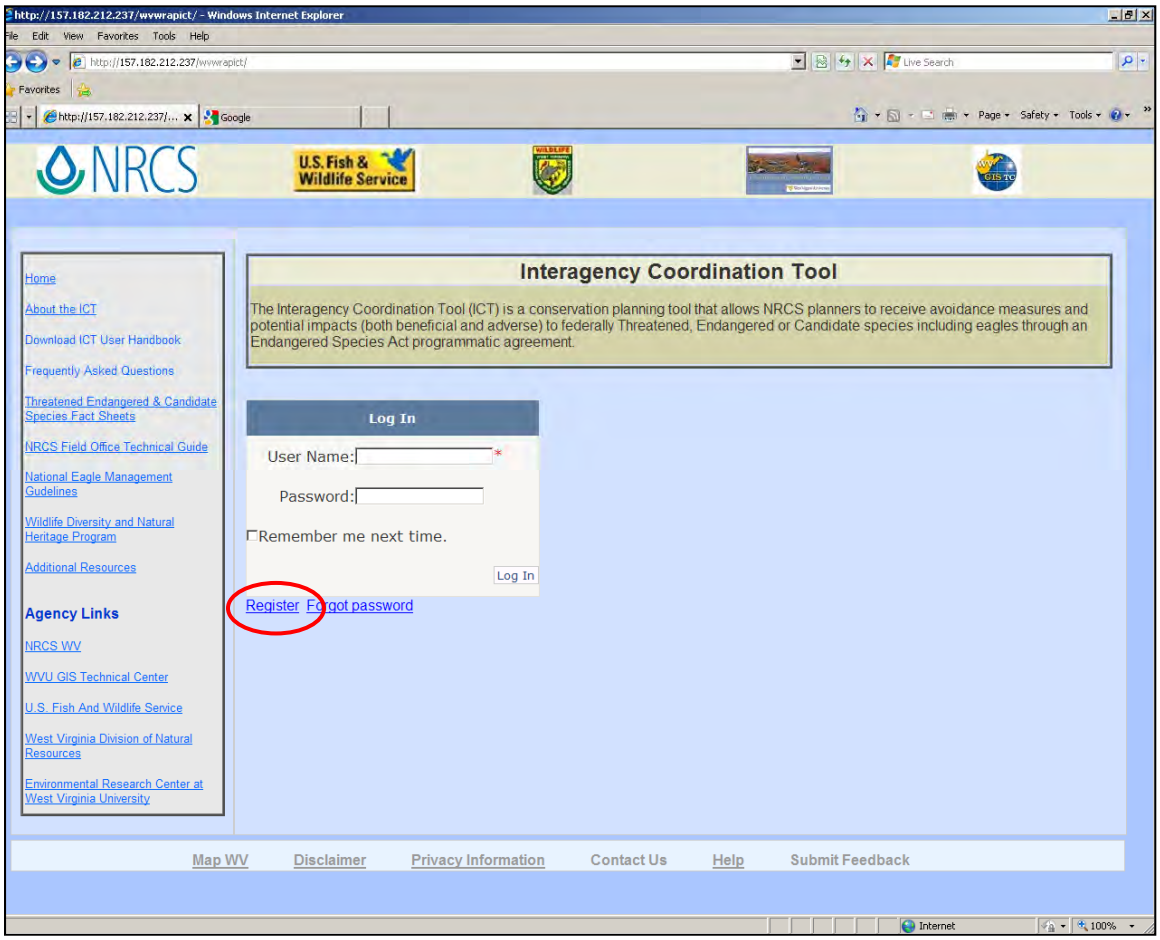


Figure 1. The first page the user encounters upon opening the link. Click the "*Register*" link circled in red to register an ICT account.

STEP 2 - Complete the details on the following page (Fig.2) and click "Create User".

Complete the remaining details on the following page (Fig.3) and click "Next". Note that NRCS employees should utilize the format for account names as [FirstLastName] (e.g. caseyshrader). Utilize your USDA email account as the email address. The address specified will be used to notify you of completed reports.

STEP 3 - Select and enter a password. Passwords must have a minimum length of seven (7) characters including at least one non-alphanumeric character. Passwords do not expire.

To change your password, login and click **Change Password**. Enter the old password and the new password and confirm. Click **Change Password**.

Once you have completed the required information, a pop-up box will appear letting the user know that they will be notified by email once the account has been approved. Click **Continue** to return to the link shown above.

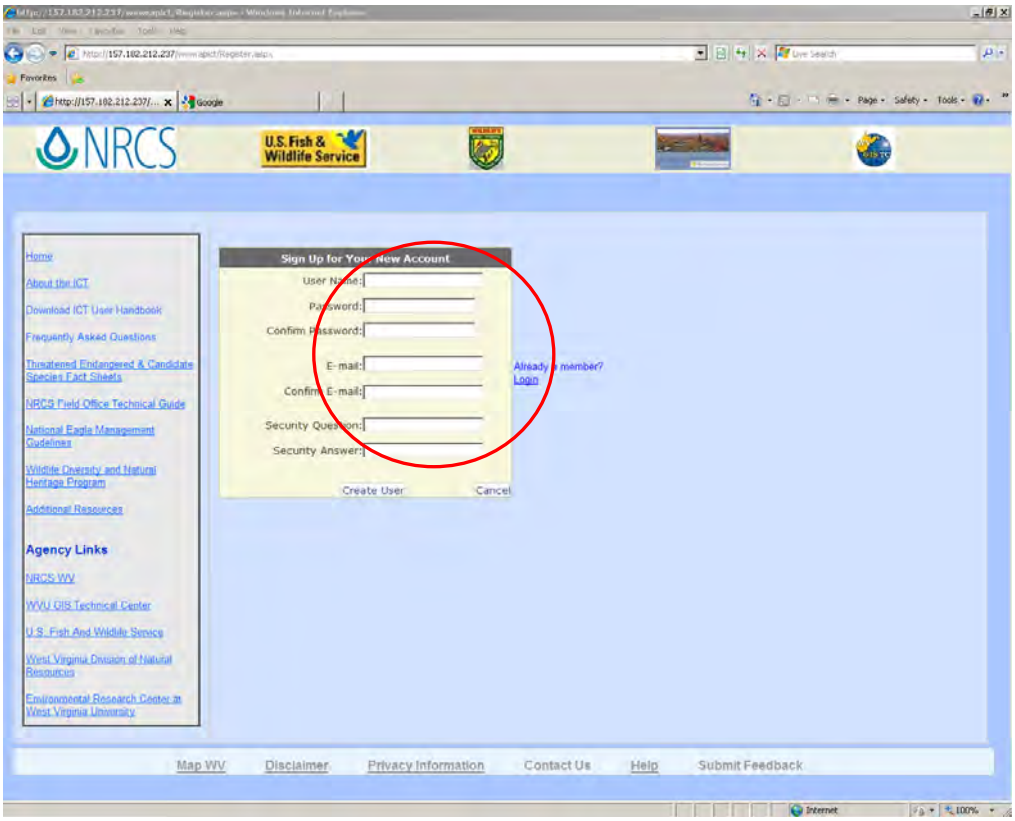


Figure 2: The registration page for the new user to create an account. The red circle shows the details required to be completed.

If users need to update their profile information (phone number, address, etc) for any reason; log into the ICT and simply click **Profile Update** at the login screen.

STEP 4 - Login as the user to run the ICT application.

Once the ICT administrator approves the account, the user can login and utilize the application. Login to the ICT using the credentials you created in the registration procedure. Once logged in, click the **Launch ICT** button to launch the application (Figure 3)

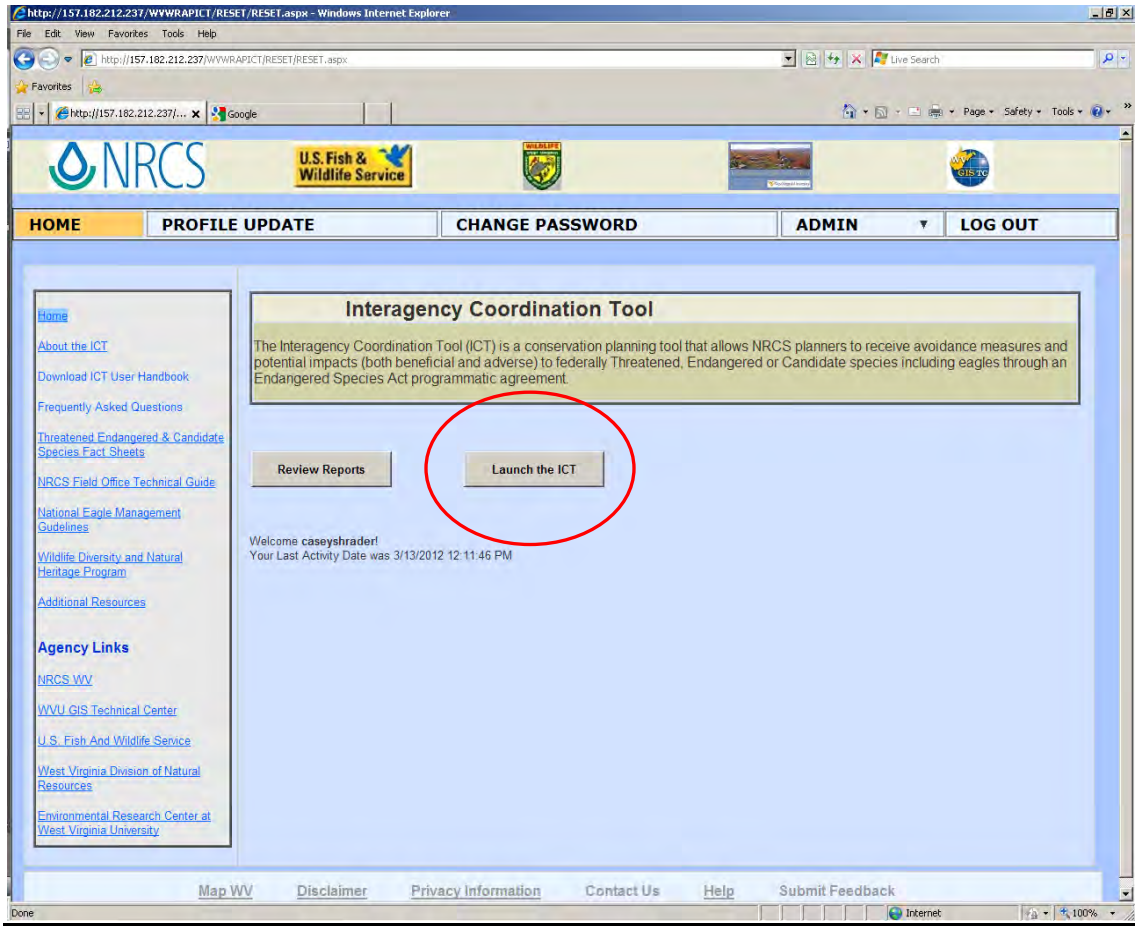


Figure 3. The user's page after the account is approved and the user logs in. From this page click **Launch ICT** to initiate the mapping application and/or review reports.

PERFORMING A QUERY IN THE ICT

The following is the standard operating procedure for determining potential effects of NRCS practices on federal-listed species in West Virginia. During the planning process the planner should review and be familiar with the Federal-listed species known to occur in their area of responsibility. Refer to the West Virginia FOTG Section II for species lists and other available material. Once obtaining a user account and password, follow the steps outlined below to run reports in the ICT.

STEP 1 – Login using the appropriate protocols and user credentials at: http://www.mapwv.gov/ICT and launch the ICT. (Temporary URL is http://157.182.212.237/wvwrapict/).

STEP 2 – Using the tools in the small box displayed, enter a site name. This name can be anything that the user deems as an appropriate identifier such as farm number, tract number, nickname (old home place, etc.) Next, enter the client's name. This field should contain a unique identifier that reflects the client type such as a name or business with whom the planner is working. A location may be entered to further describe the site. It may be utilized to identify a particular tract and/or farm number or other unique identifier. (e.g. Farm 123 Tract 456 or old home place)

STEP 3 – Zoom to the desired area of the map by selecting the pan tool [hand] and double clicking on a selected area, thereby reducing the scale of the map until you are able to identify the desired area. Users may also use the scale tool located on the left side of the map to quickly zoom to a location. No particular map scale is required, but select a scale that displays the entire area of interest.

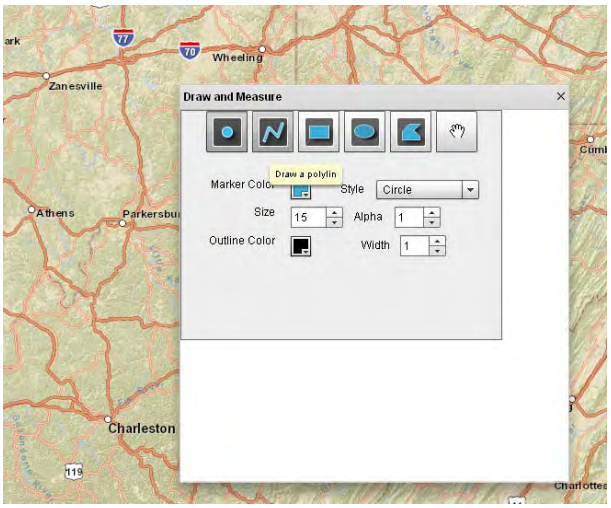
Users may also use the **Zoom To** tool located on the left side of the map to rapidly enter location information such as county, city or topographic quad. Users may find sites by coordinate systems, known addresses, coordinates, etc. In addition, an address bar located above the map may be used to zoom directly to a known address.

Users may also select different base maps using the choices displayed by selecting the button labeled as **Basemap**. Imagery available includes aerial photography, topographic maps or hybrids of road maps and aerial photography. No particular map type is required but final reports containing aerial photography are preferred. The user is free to select which map best meets their needs. Select different maps by clicking the radio button adjacent to the desired map.

STEP 4 – Once the location and base map have been selected, use the scale tool or double-click to set the map to an appropriate size that allows users to select the area of interest (AOI). The AOI should include the planning unit to which practices will be installed, planned or considered (this is most often the property boundary of the client).

Planners may also turn on various reference aspects including physical address labels, contour lines, streams, etc to assist with determining the AOI. This may be accomplished by clicking the **Reference** button on the browser bar along the top of the map and selecting the layer(s) desired. The transparency of selected layers may be adjusted by sliding the bar adjacent to the layer to the left or right. Select the polygon tool or click the measuring tool button in the tool bar for additional options. Note that some information may not be available until the base map is at a particular scale. Settings for known locations of eagle nesting sites, golden-winged warblers or other habitats may also be selected or manipulated using this button.

Another feature of the ICT is that it allows users to apply measuring tools and markers by clicking the ruler icon in the upper right-hand corner of the toolbar. This feature allows planners to measure area or distance and mark special features in various colors and shapes. Units are specified by the planner as metric or English.



This is useful when attempting to determine the approximate distances from specific landmarks such as eagle nests or when working on golden-winged warbler habitat.

Figure 4. ICT measurement tool bar.

Delineate the AOI by using one of the drawing tools to create a polygon at an appropriate scale. Draw the polygon by selecting the middle polygon button and clicking a point somewhere on the boundary of the AOI. Continue along the boundary of the AOI clicking once on key areas to anchor the point of the polygon until the initial starting point is reached. Double click to close the shape. If the shape drawn is not suitable, click the mouse somewhere outside the AOI to clear and redraw the shape. Once the shape is complete, click **Next**.

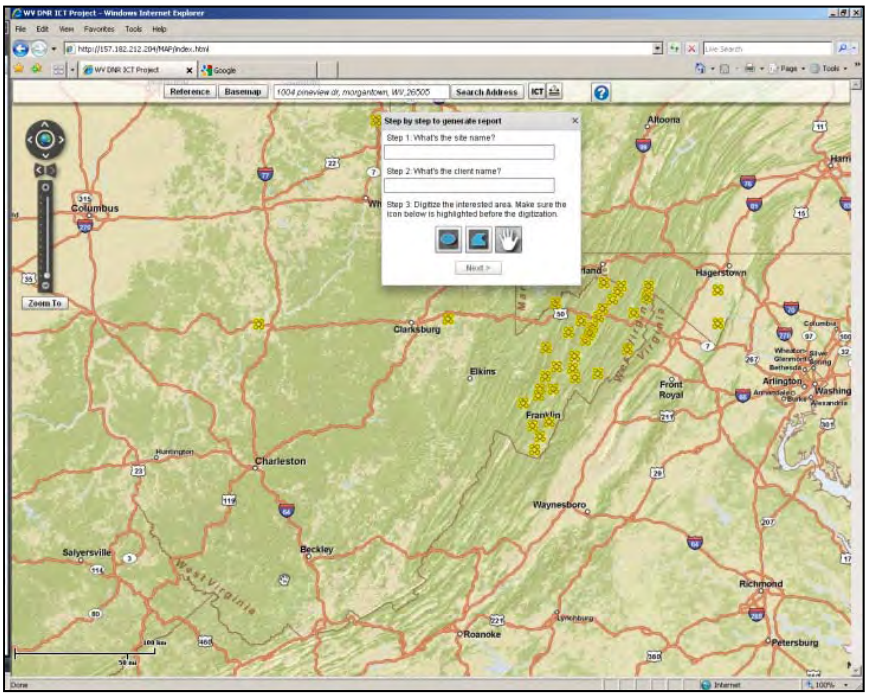
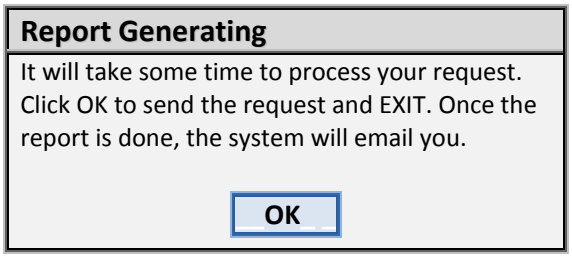


Figure 5. The mapping application where the user can zoom to the interested area, select the area of interest and draw the required polygon.

STEP 5 - Where indicated, select all the practices that are planned within the AOI by clicking a ✓ in the box adjacent to the practice. Once all planned practices have been selected click **Next**. A box will appear containing the practices you previously selected and will ask you to enter the amount of each practice planned in the appropriate units.

***NOTE**: Some practice units may not match the NRCS conservation standard unit. For example, the conservation practice (378) Pond unit is listed as number (No.) in the FOTG. The ICT requires the approximate size of the pond(s) in acres (ac.) in order to make potential impact interpretations. Therefore planners should calculate the total acreage of the pond(s) and enter it into the ICT.*

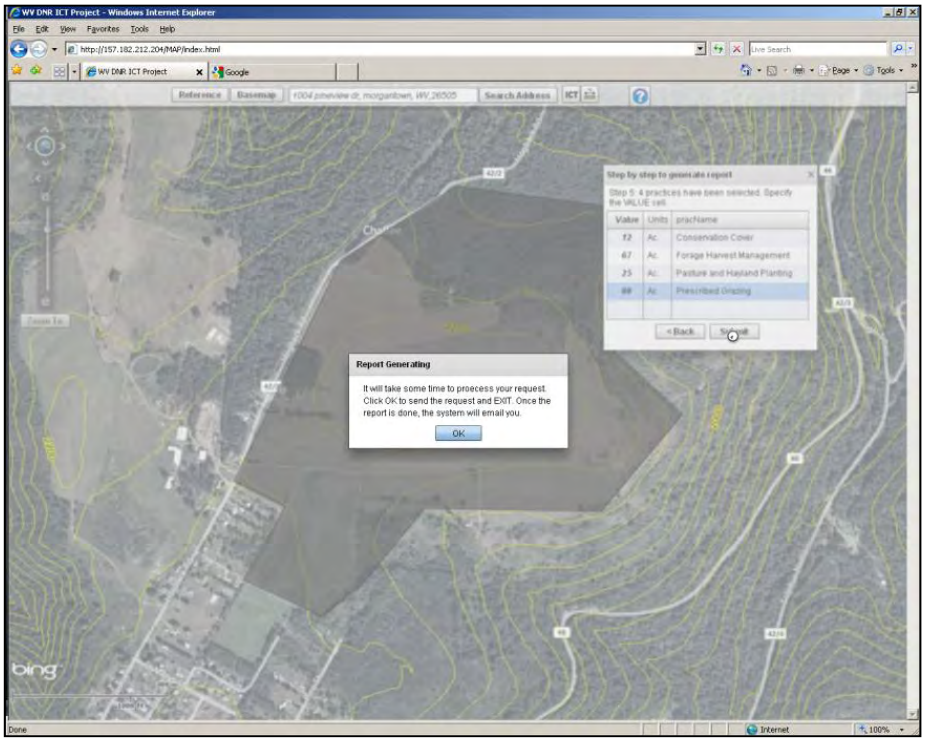
Planners may select **Back** to add or remove practices. Once complete, click the **Submit** button. A pop-up box will appear on the screen with the following message:



Planner's Note:

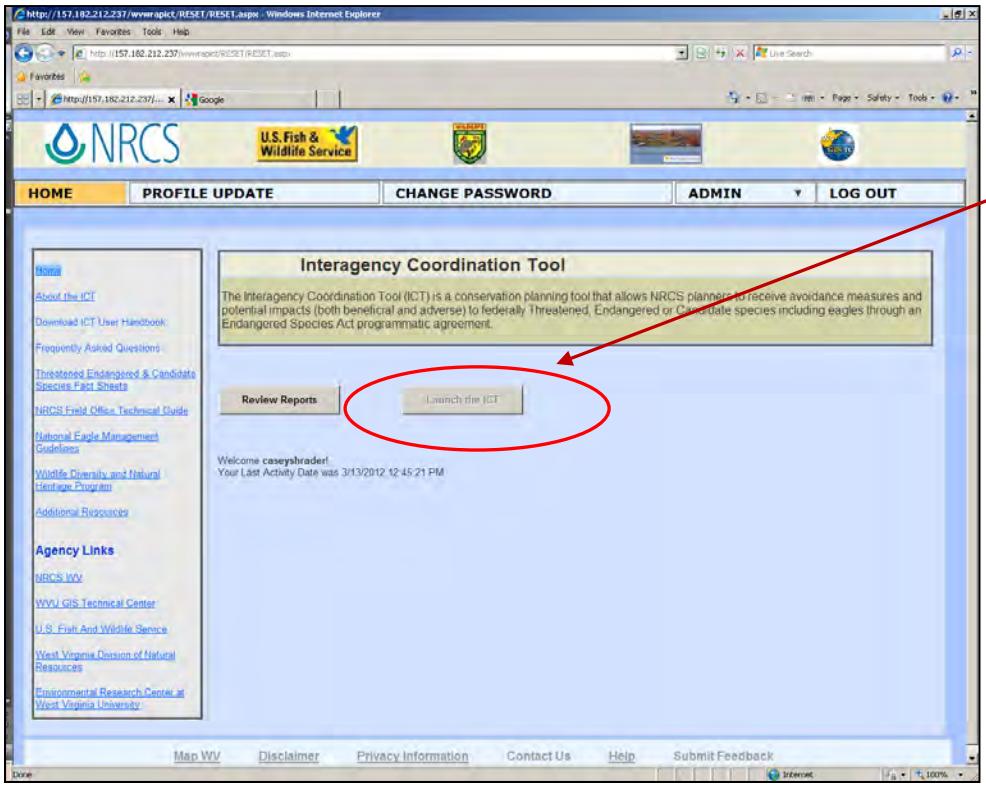
There may be a 10-15 second delay prior to receiving the message above. Do not continue to click the OK button as this will result in production of multiple reports for the same area.

The ICT is now ready to process the request and the user will be notified once the process is complete.



STEP 6 - Click **OK** to initiate the query. The user will be redirected back to the ICT homepage. There will be a period of time before the system notifies the user that the query is complete. The length of this period will vary depending on a number of factors including the number of users, time of day, size of request, etc. Once you are notified that the report you submitted is complete, log back in to the ICT and select the **Review Reports** button.

Figure 6. After an area of interest has been drawn, the practices have been selected and quantities provided, the ICT notifies the user that the report is being processed.



NOTE: If you attempt to perform an additional query during the report processing period, the **Launch ICT** button will be grayed out and will not function. It will resume function upon notification of completion of the last submitted query. However, users may review previously completed reports at anytime by selecting the **Review Reports** button.

Figure 7. Screen shot after a query has been submitted.

ICT REPORT FORMAT

The ICT report is generated after a user has provided inputs based on a specific location, practices and extents of those practices. The report that is generated is formatted into five major sections which include a general information section.

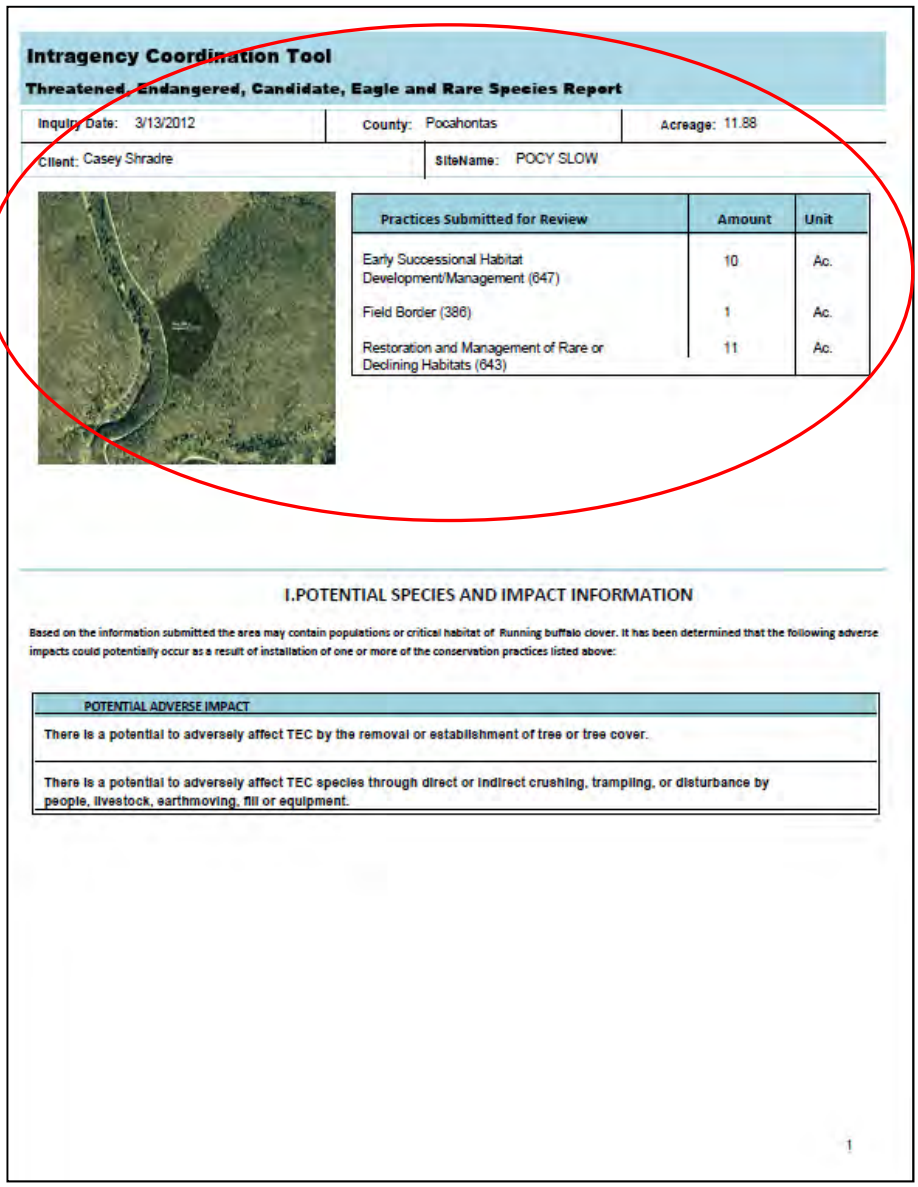
The length of ICT reports vary depending on the number of practices, species determinations and avoidance measures required. However as a general rule, reports are between two and five pages in length and are created in portable document format (.pdf). Adobe Acrobat © Reader is required to view these documents. They may be printed or stored electronically with other customer files and are usually between 500 and 800kb in size. This allows them to be emailed through conventional accounts if necessary.

Reports are stored and retained for viewing on the ICT website for a period of time. The length of storage will depend on various factors including space available, the number of reports ran annually and maintenance issues. Contact the state administrator for more information. It is advisable to save a local copy of all final queries and maintain them at the local level. It is also advisable to print the final report (double sided) and attach to the CPA-52 worksheet for proof of compliance.

NRCS field and area offices are encouraged to establish their own protocols and/or naming conventions for ICT reports. This will provide some consistency and eliminate possible confusion should the need arise to retrieve reports from the ICT website or locate them at the state level. Planners may provide a copy of the ICT report to the landowner if needed. However, this is not recommended without a thorough explanation of their meaning and intent. Individuals other than landowners should not be provided copies of the report unless directed to do so in writing by the client/landowner. The information contained in the report should be treated with the same regard

for privacy as the rest of the conservation plan information. Refer to the section of this document regarding privacy. The following pages provide a brief overview of the report layout.

GENERAL INFORMATION SECTION OF THE ICT REPORT



Intragency Coordination Tool

Threatened, Endangered, Candidate, Eagle and Rare Species Report

Inquiry Date: 3/13/2012 | County: Pocahontas | Acreage: 11.88

Client: Casey Shradre | SiteName: POCY SLOW

Practices Submitted for Review	Amount	Unit
Early Successional Habitat Development/Management (647)	10	Ac.
Field Border (386)	1	Ac.
Restoration and Management of Rare or Declining Habitats (643)	11	Ac.

I.POTENTIAL SPECIES AND IMPACT INFORMATION

Based on the information submitted the area may contain populations or critical habitat of Running buffalo clover. It has been determined that the following adverse impacts could potentially occur as a result of installation of one or more of the conservation practices listed above:

POTENTIAL ADVERSE IMPACT
There is a potential to adversely affect TEC by the removal or establishment of tree or tree cover.
There is a potential to adversely affect TEC species through direct or indirect crushing, trampling, or disturbance by people, livestock, earthmoving, fill or equipment.

1

Figure 9. Example ICT report with the general information section identified.

The general information portion of the ICT report contains information that is gathered from the user such as the client's name, the location, the polygon outlined on the location map, the practices planned and the extent of each conservation practice. The details are outlined below.

Map: A map appears on the left-hand side of the page containing the user-outlined polygon (area of interest - AOI). An icon may appear on the map within or near the AOI indicating that a known eagle nest is in the vicinity at the location shown.

Inquiry Date: This is the date in which the query was submitted through the ICT.

Client's Name: Identifies the name of the landowner or business with whom you are working.

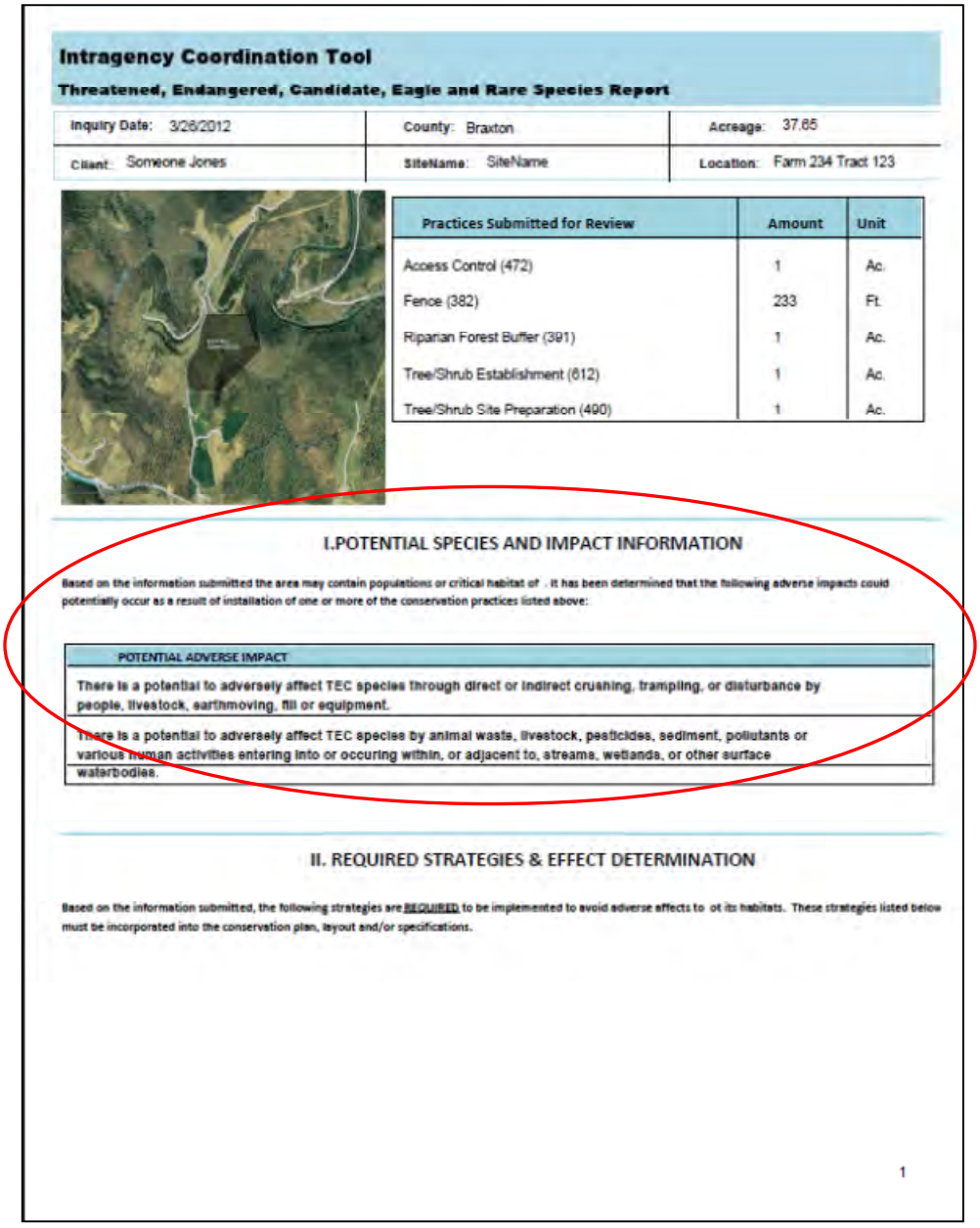
County: This is the county in West Virginia in which the AOI exists.

Location: (*optional*) This may be utilized to identify a particular tract and/or farm number or other unique identifier. (e.g. old home place)

Acreage: The acreage of the AOI drawn by the user rounded to the nearest tenth of an acre.

Practices Submitted for Review: The conservation practices and extents and appropriate units submitted for review by the ICT. Note some units may differ from NRCS units due to required impact evaluation.

SECTION I - POTENTIAL IMPACTS



Intragency Coordination Tool

Threatened, Endangered, Candidate, Eagle and Rare Species Report

Inquiry Date: 3/26/2012	County: Braxton	Acreage: 37.65
Client: Someone Jones	SiteName: SiteName	Location: Farm 234 Tract 123

Practices Submitted for Review	Amount	Unit
Access Control (472)	1	Ac.
Fence (382)	233	Ft.
Riparian Forest Buffer (391)	1	Ac.
Tree/Shrub Establishment (612)	1	Ac.
Tree/Shrub Site Preparation (490)	1	Ac.

I.POTENTIAL SPECIES AND IMPACT INFORMATION

Based on the information submitted the area may contain populations or critical habitat of . It has been determined that the following adverse impacts could potentially occur as a result of installation of one or more of the conservation practices listed above:

POTENTIAL ADVERSE IMPACT
There is a potential to adversely affect TEC species through direct or indirect crushing, trampling, or disturbance by people, livestock, earthmoving, fill or equipment.
There is a potential to adversely affect TEC species by animal waste, livestock, pesticides, sediment, pollutants or various human activities entering into or occuring within, or adjacent to, streams, wetlands, or other surface waterbodies.

II. REQUIRED STRATEGIES & EFFECT DETERMINATION

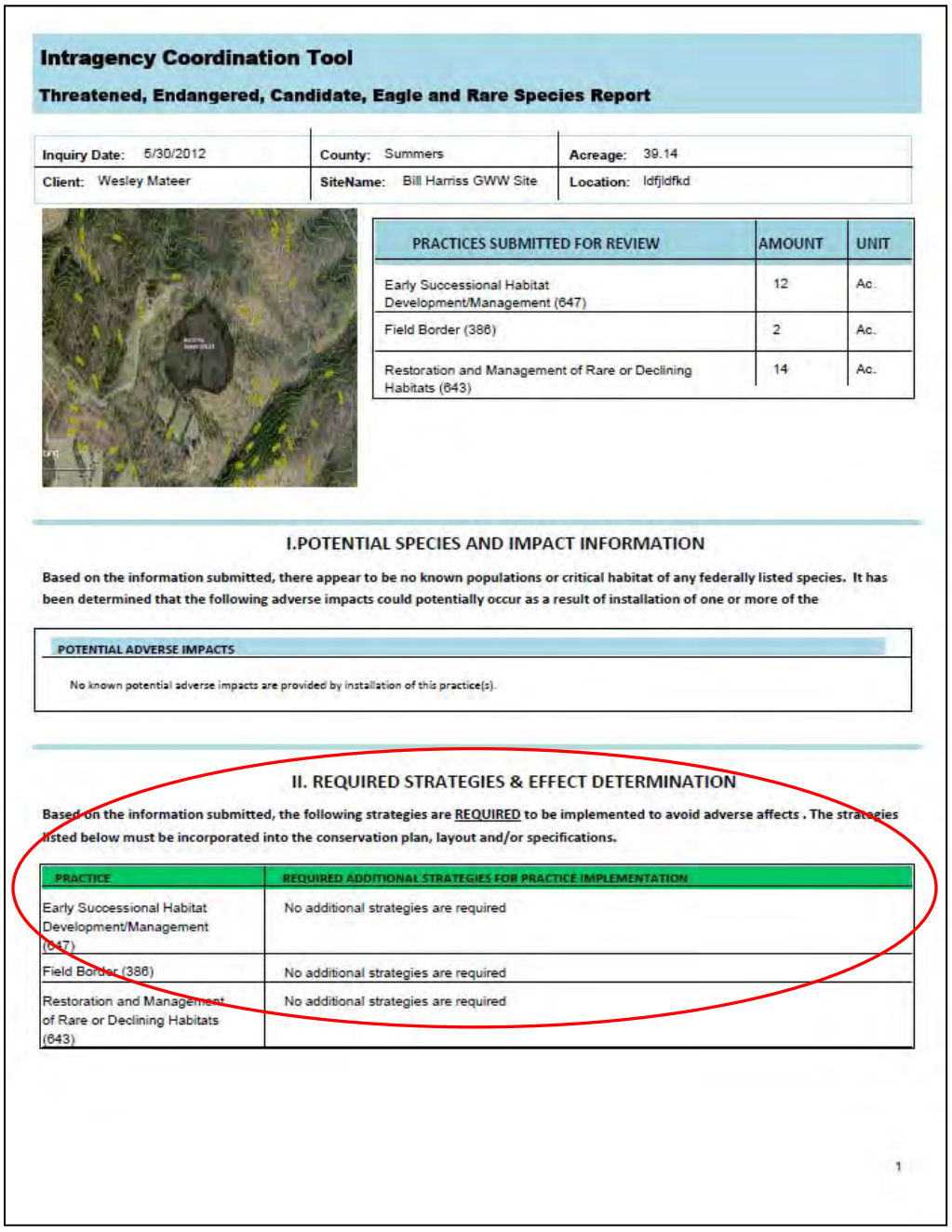
Based on the information submitted, the following strategies are REQUIRED to be implemented to avoid adverse affects to ot its habitats. These strategies listed below must be incorporated into the conservation plan, layout and/or specifications.

1

Section I of the ICT report identifies the species or list of species that may be affected by installation of conservation practices and how those species could be impacted. The format of this section will vary depending on the results found and any resulting potential impacts. It may contain only a small narrative; or a narrative and a table containing potential impacts.

Figure 10. Example ICT report showing potential adverse impacts to listed species.

SECTION II - REQUIRED STRATEGIES & EFFECT DETERMINATION



Intragency Coordination Tool

Threatened, Endangered, Candidate, Eagle and Rare Species Report

Inquiry Date: 5/30/2012	**County:** Summers	**Acreage:** 39.14
Client: Wesley Mateer	**SiteName:** Bill Harriss GWW Site	**Location:** ldfjldfkd

PRACTICES SUBMITTED FOR REVIEW	AMOUNT	UNIT
Early Successional Habitat Development/Management (647)	12	Ac.
Field Border (386)	2	Ac.
Restoration and Management of Rare or Declining Habitats (643)	14	Ac.

I.POTENTIAL SPECIES AND IMPACT INFORMATION

Based on the information submitted, there appear to be no known populations or critical habitat of any federally listed species. It has been determined that the following adverse impacts could potentially occur as a result of installation of one or more of the

POTENTIAL ADVERSE IMPACTS
No known potential adverse impacts are provided by installation of this practice(s).

II. REQUIRED STRATEGIES & EFFECT DETERMINATION

Based on the information submitted, the following strategies are REQUIRED to be implemented to avoid adverse affects . The strategies listed below must be incorporated into the conservation plan, layout and/or specifications.

PRACTICE	REQUIRED ADDITIONAL STRATEGIES FOR PRACTICE IMPLEMENTATION
Early Successional Habitat Development/Management (647)	No additional strategies are required
Field Border (386)	No additional strategies are required
Restoration and Management of Rare or Declining Habitats (643)	No additional strategies are required

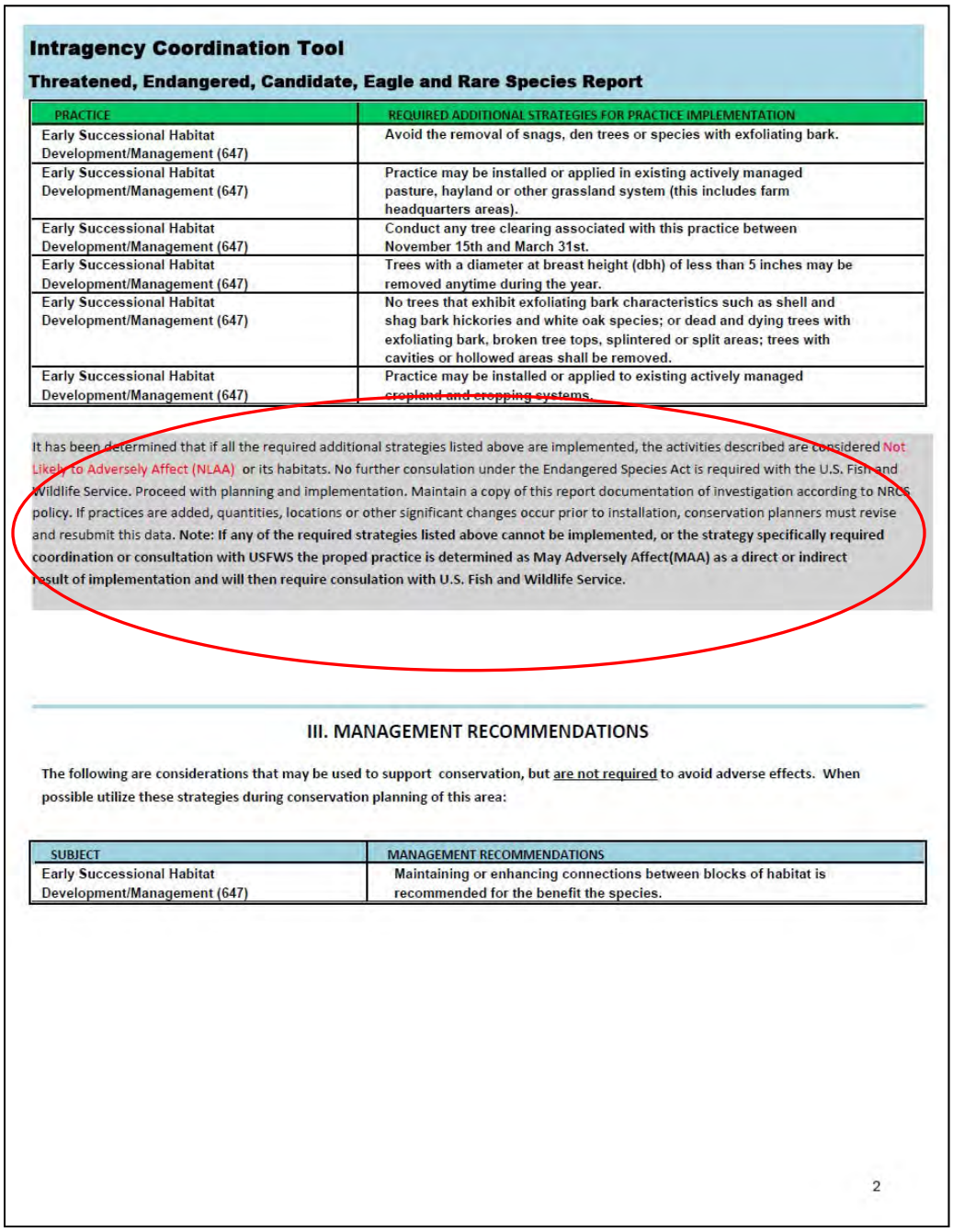
1

Figure 11. Table in section II showing additional strategies required to implement these conservation practices.

Section II of the ICT report is critical to conservation planners. If the query results in potential impacts (listed in section I) this section lists all the required strategies that the landowner must implement to avoid potential adverse impacts. The length of this section will vary depending on several factors including the number of practices and the impacts those practices have on listed species.

If avoidance measures are required, **these strategies must become part of the specifications of conservation plans**.

FINAL EFFECT DETERMINATION (Section II)



Intragency Coordination Tool

Threatened, Endangered, Candidate, Eagle and Rare Species Report

PRACTICE	REQUIRED ADDITIONAL STRATEGIES FOR PRACTICE IMPLEMENTATION
Early Successional Habitat Development/Management (647)	Avoid the removal of snags, den trees or species with exfoliating bark.
Early Successional Habitat Development/Management (647)	Practice may be installed or applied in existing actively managed pasture, hayland or other grassland system (this includes farm headquarters areas).
Early Successional Habitat Development/Management (647)	Conduct any tree clearing associated with this practice between November 15th and March 31st.
Early Successional Habitat Development/Management (647)	Trees with a diameter at breast height (dbh) of less than 5 inches may be removed anytime during the year.
Early Successional Habitat Development/Management (647)	No trees that exhibit exfoliating bark characteristics such as shell and shag bark hickories and white oak species; or dead and dying trees with exfoliating bark, broken tree tops, splintered or split areas; trees with cavities or hollowed areas shall be removed.
Early Successional Habitat Development/Management (647)	Practice may be installed or applied to existing actively managed cropland and cropping systems.

It has been determined that if all the required additional strategies listed above are implemented, the activities described are considered Not Likely to Adversely Affect (NLAA) or its habitats. No further consulation under the Endangered Species Act is required with the U.S. Fish and Wildlife Service. Proceed with planning and implementation. Maintain a copy of this report documentation of investigation according to NRCS policy. If practices are added, quantities, locations or other significant changes occur prior to installation, conservation planners must revise and resubmit this data. **Note: If any of the required strategies listed above cannot be implemented, or the strategy specifically required coordination or consultation with USFWS the proped practice is determined as May Adversely Affect(MAA) as a direct or indirect result of implementation and will then require consulation with U.S. Fish and Wildlife Service.**

III. MANAGEMENT RECOMMENDATIONS

The following are considerations that may be used to support conservation, but are not required to avoid adverse effects. When possible utilize these strategies during conservation planning of this area:

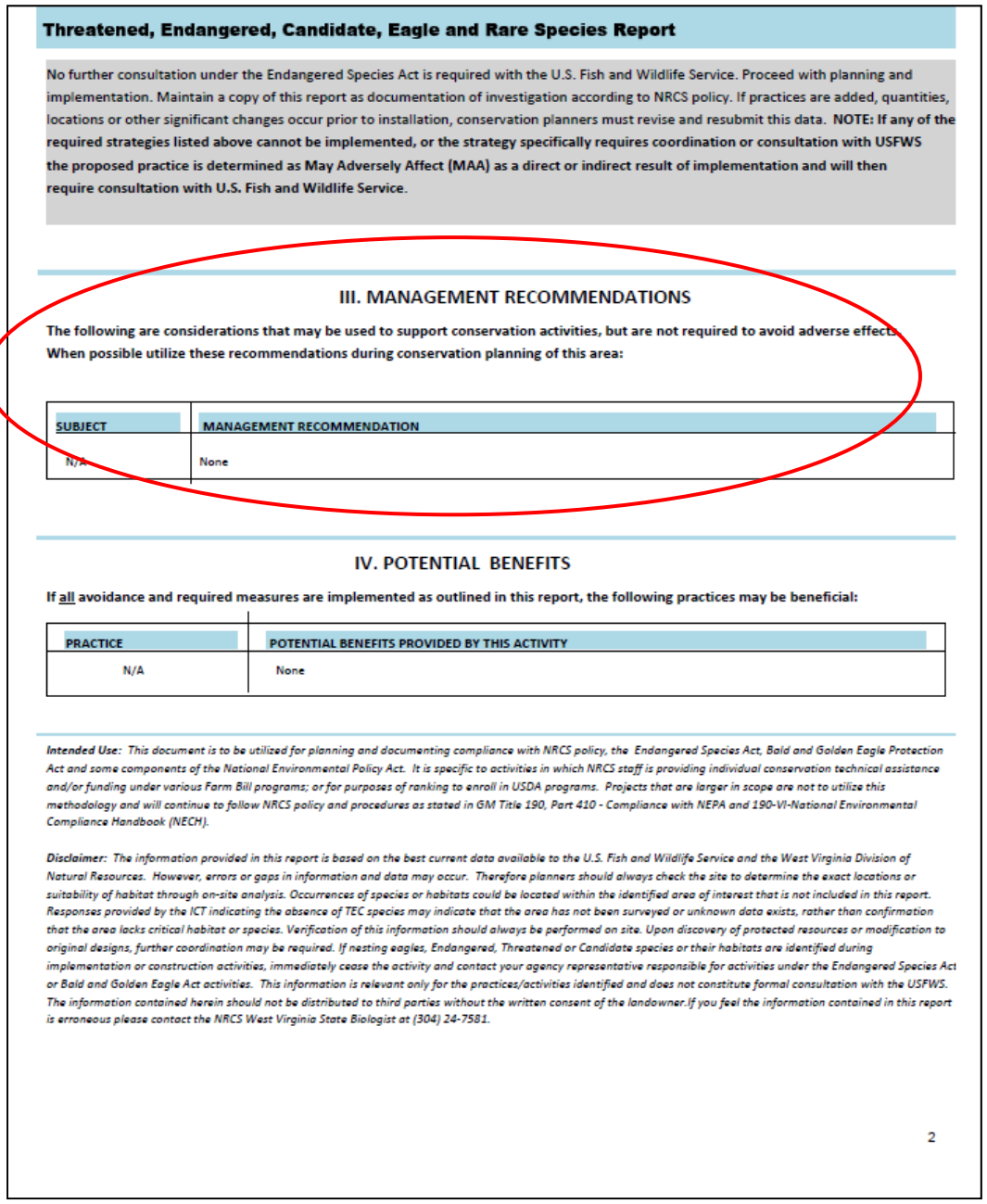
SUBJECT	MANAGEMENT RECOMMENDATIONS
Early Successional Habitat Development/Management (647)	Maintaining or enhancing connections between blocks of habitat is recommended for the benefit the species.

2

This section of the report gives the planner the final effect determination of the query. If there are required additional strategies for practice implementation and they are able to be implemented by the client this is the final determination. This assumes that all the required additional strategies for avoidance are implemented. The wording of this section will vary depending on the results of the query.

Figure 12. Box at the end of section II showing the final determination as long as all required strategies are implemented.

SECTION III – MANAGEMENT RECOMMENDATIONS



Threatened, Endangered, Candidate, Eagle and Rare Species Report

No further consultation under the Endangered Species Act is required with the U.S. Fish and Wildlife Service. Proceed with planning and implementation. Maintain a copy of this report as documentation of investigation according to NRCS policy. If practices are added, quantities, locations or other significant changes occur prior to installation, conservation planners must revise and resubmit this data. **NOTE: If any of the required strategies listed above cannot be implemented, or the strategy specifically requires coordination or consultation with USFWS the proposed practice is determined as May Adversely Affect (MAA) as a direct or indirect result of implementation and will then require consultation with U.S. Fish and Wildlife Service.**

III. MANAGEMENT RECOMMENDATIONS

The following are considerations that may be used to support conservation activities, but are not required to avoid adverse effects. When possible utilize these recommendations during conservation planning of this area:

SUBJECT	MANAGEMENT RECOMMENDATION
N/A	None

IV. POTENTIAL BENEFITS

If all avoidance and required measures are implemented as outlined in this report, the following practices may be beneficial:

PRACTICE	POTENTIAL BENEFITS PROVIDED BY THIS ACTIVITY
N/A	None

Intended Use: This document is to be utilized for planning and documenting compliance with NRCS policy, the Endangered Species Act, Bald and Golden Eagle Protection Act and some components of the National Environmental Policy Act. It is specific to activities in which NRCS staff is providing individual conservation technical assistance and/or funding under various Farm Bill programs; or for purposes of ranking to enroll in USDA programs. Projects that are larger in scope are not to utilize this methodology and will continue to follow NRCS policy and procedures as stated in GM Title 190, Part 410 - Compliance with NEPA and 190-VI-National Environmental Compliance Handbook (NECH).

Disclaimer: The information provided in this report is based on the best current data available to the U.S. Fish and Wildlife Service and the West Virginia Division of Natural Resources. However, errors or gaps in information and data may occur. Therefore planners should always check the site to determine the exact locations or suitability of habitat through on-site analysis. Occurrences of species or habitats could be located within the identified area of interest that is not included in this report. Responses provided by the ICT indicating the absence of TEC species may indicate that the area has not been surveyed or unknown data exists, rather than confirmation that the area lacks critical habitat or species. Verification of this information should always be performed on site. Upon discovery of protected resources or modification to original designs, further coordination may be required. If nesting eagles, Endangered, Threatened or Candidate species or their habitats are identified during implementation or construction activities, immediately cease the activity and contact your agency representative responsible for activities under the Endangered Species Act or Bald and Golden Eagle Act activities. This information is relevant only for the practices/activities identified and does not constitute formal consultation with the USFWS. The information contained herein should not be distributed to third parties without the written consent of the landowner.If you feel the information contained in this report is erroneous please contact the NRCS West Virginia State Biologist at (304) 24-7581.

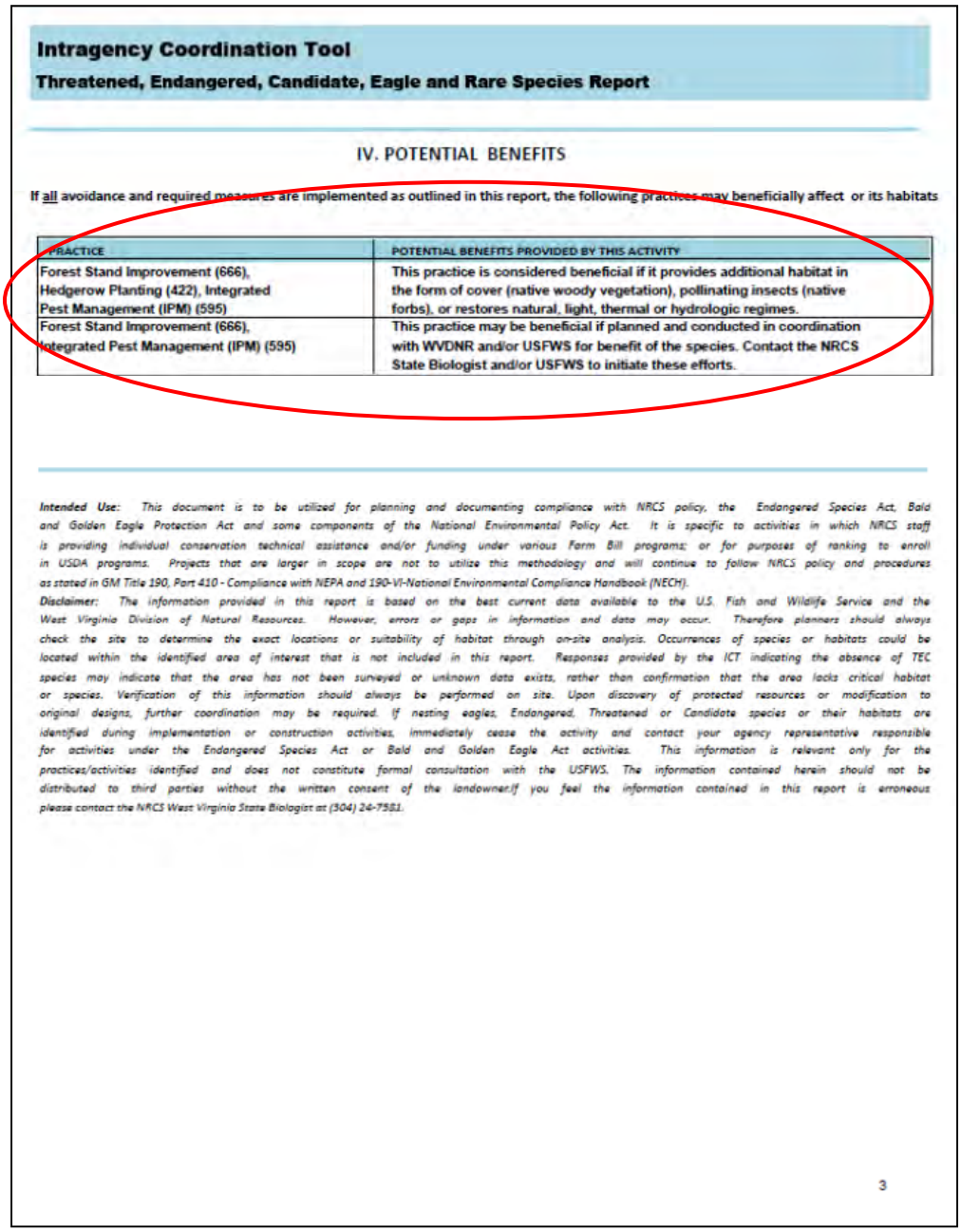
2

Figure 12. Section III showing additional management recommendations associated with the area of interest or conservation practices..

Section III of the ICT report lists management recommendations made by the resource agencies identifying alternatives that clients may voluntarily elect to incorporate into their conservation plan. Recommendations in this section are not required to be implemented.

Some reports will not have management recommendations associated with them.

SECTION IV – BENEFITS



Intragency Coordination Tool

Threatened, Endangered, Candidate, Eagle and Rare Species Report

IV. POTENTIAL BENEFITS

If all avoidance and required measures are implemented as outlined in this report, the following practices may beneficially affect or its habitats

PRACTICE	POTENTIAL BENEFITS PROVIDED BY THIS ACTIVITY
Forest Stand Improvement (666), Hedgerow Planting (422), Integrated Pest Management (IPM) (595)	This practice is considered beneficial if it provides additional habitat in the form of cover (native woody vegetation), pollinating insects (native forbs), or restores natural, light, thermal or hydrologic regimes.
Forest Stand Improvement (666), Integrated Pest Management (IPM) (595)	This practice may be beneficial if planned and conducted in coordination with WVDNR and/or USFWS for benefit of the species. Contact the NRCS State Biologist and/or USFWS to initiate these efforts.

Intended Use: This document is to be utilized for planning and documenting compliance with NRCS policy, the Endangered Species Act, Bald and Golden Eagle Protection Act and some components of the National Environmental Policy Act. It is specific to activities in which NRCS staff is providing individual conservation technical assistance and/or funding under various Farm Bill programs; or for purposes of ranking to enroll in USDA programs. Projects that are larger in scope are not to utilize this methodology and will continue to follow NRCS policy and procedures as stated in GM Title 190, Part 410 - Compliance with NEPA and 190-VI-National Environmental Compliance Handbook (NECH).

Disclaimer: The information provided in this report is based on the best current data available to the U.S. Fish and Wildlife Service and the West Virginia Division of Natural Resources. However, errors or gaps in information and data may occur. Therefore planners should always check the site to determine the exact locations or suitability of habitat through on-site analysis. Occurrences of species or habitats could be located within the identified area of interest that is not included in this report. Responses provided by the ICT indicating the absence of TEC species may indicate that the area has not been surveyed or unknown data exists, rather than confirmation that the area lacks critical habitat or species. Verification of this information should always be performed on site. Upon discovery of protected resources or modification to original designs, further coordination may be required. If nesting eagles, Endangered, Threatened or Candidate species or their habitats are identified during implementation or construction activities, immediately cease the activity and contact your agency representative responsible for activities under the Endangered Species Act or Bald and Golden Eagle Act activities. This information is relevant only for the practices/activities identified and does not constitute formal consultation with the USFWS. The information contained herein should not be distributed to third parties without the written consent of the landowner.If you feel the information contained in this report is erroneous please contact the NRCS West Virginia State Biologist at (304) 24-7581.

3

Figure 13. Table in Section IV showing additional strategies required to implement these conservation practices.

Section IV of the ICT report identifies potential benefits that could be realized by an installation of a conservation practice. The benefits fall into one or more of twelve different categories. Refer to the *West Virginia NRCS Conservation Practice Effects on Threatened, Endangered, Candidate and Eagle Species for Planning and Program Implementation* for a complete list of potential benefits realized from conservation practice implementation.

VIEWING ICT REPORTS

ICT reports are available to view once the system has processed the query and the user receives an email similar to the following:

FROM: donotreply@mail.wvu.edu
To: Shrader, Casey – NRCS, Morgantown, WV

Subject: Status of the ICT Report

Your [**Report Name**] is ready to be viewed. Please click on the following link and login to view the report at http://www.mapwv.gov/ICT.

Sincerely,
The ICT

The process for viewing reports once a query has been submitted is as follows:

STEP 1 - Click the link to open the homepage of the ICT and login.

STEP 2 - Once logged in, click the button that says **Review Reports**. The user will be directed to the Review Previous Reports page.

STEP 3 – Select a method to view the completed reports. These include user name, date of request, species, etc. Click on **View Report** to open the report in a new window in Adobe © Acrobat Reader format. Note that Acrobat Reader must be installed on the computer to view the document.

Planner's Note:

To ensure that your email reader program is able to receive email from the ICT set any junk mail settings to allow mail from the ICT domain. Contact the computer specialist for your area to assist you in adjusting those settings if needed.

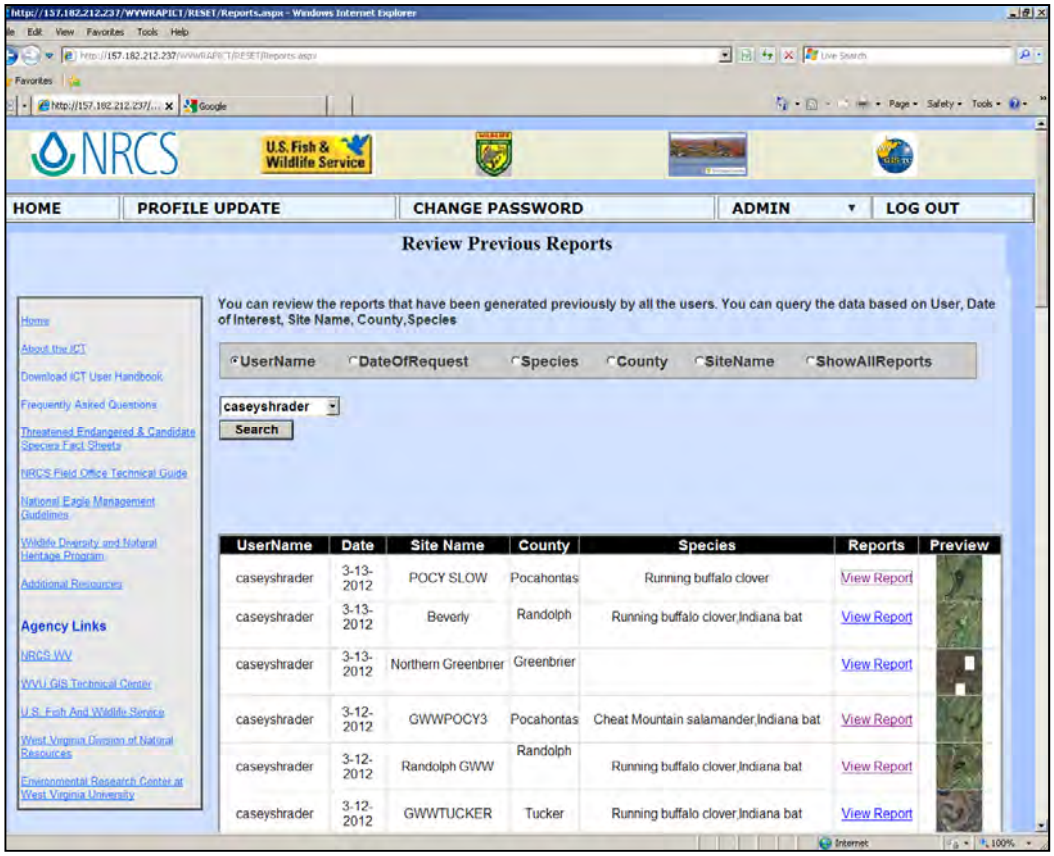


Figure 14. View previously submitted reports page

Reports are stored in order of the date in which they were submitted (earliest to latest) by default. Reports are identified by the site name, the date they were submitted and the county in which the AOI resides. A thumbnail of the AOI which may be enlarged is listed to the right of the link to view the report. Notice that users can query previously submitted reports by user, date of interest, site name, county, municipality or species to aid in retrieval.

ICT ADMINISTRATIVE PRIVILEGES

The ICT was constructed to have layers of administrative control. The primary layer allows users of the ICT to query and review only the reports that the user has performed under their login. Every conservation planner must have at least this layer of administrative privilege. It is automatically received upon the approval from the State Administrator of an ICT account. Planners will not have access to certain portions of the website with this level of administrative privilege.

In addition to the normal privileges described above, the administrator login allows full access to all reports queried throughout the State and can authorize and deactivate accounts as well as review previously submitted reports for all users. This level of administrator can access the entire ICT website, generate reports and view specific areas of the website.

IV. INTERPRETING THE RESULTS OF THE ICT

In order to implement the results of the ICT, planners must be able to interpret the information provided and if necessary convey that information to the client by incorporation into specifications, designs or maintenance of conservation practices. This portion of the handbook outlines the report generated and provides guidance for application.

POTENTIAL SPECIES AND IMPACT INFORMATION

Potential adverse impacts are described fully in the programmatic consultation document in Section II of the Field Office Technical Guide entitled *West Virginia NRCS Conservation Practice Effects on Threatened, Endangered, Candidate and Eagle Species for Planning and Program Implementation.* These impacts were determined as the basic ways species or habitats could be negatively affected by the methods in which the practice was installed, operated or maintained.

Potential adverse impacts to listed species (not including eagles*) are grouped into seven broad categories by the ICT. Any of these seven impacts may apply to any of the listed species. Multiple impacts may apply to a single species as a result of practice installation; and several may apply to multiple practices. The basic impact categories are as follows:

1. Pollution of surface water
2. Pollution of ground water
3. Removal of trees or tree cover
4. Crushing, trampling or direct disturbance
5. Manipulation of water regimes
6. Changes in landuse
7. Chemical toxicity

* Disturbance (audibly and visually) to nesting eagles

Potential adverse impacts are the basis of the final determination the ICT produces and are included to allow planners and clients the ability to understand why the avoidance strategies (if any) are required. The following are examples of possible outcomes in section I of the ICT report.

Example 1:
If there are no known species or potential adverse impacts affecting the AOI, the ICT output will state the following:

Based on the information submitted, there appear to be no known populations or critical habitat of any federally listed species. It has been determined that the following adverse impacts could potentially occur as a result of installation of one or more of the conservation practices listed above:

POTENTIAL ADVERSE IMPACTS
No known potential adverse impacts are provided by installation of this practice(s).

This output indicates that there are no listed resources potentially affected by the practices and the planner may proceed.

Example 2:
Listed species are identified as potentially affected; the ICT output will identify the species or list of species as follows:

Based on the information submitted the area may contain populations or critical habitat of Northeastern bulrush. It has been determined that the following adverse impacts could potentially occur as a result of installation of one or more of the conservation practices listed above:

POTENTIAL ADVERSE IMPACTS
There is a potential to adversely affect listed species by animal waste, livestock, pesticides, sediment, pollutants or various human activities entering into or occurring within or adjacent to, streams, wetlands or other surface waterbodies.
There is a potential to adversely affect listed species through the manipulation of hydrologic regimes or the alteration of hydrology through diversion, impoundment, removal or flooding.
There is a potential to adversely affect listed species through direct or indirect crushing, trampling or disturbance by people, livestock, earthmoving, fill or equipment.

This example shows that there are three known potentially adverse impacts associated with the installation of the practices to Northeastern bulrush. Planners need to proceed to following sections of the report to determine how to avoid these potential impacts.

Example 3:
Listed species are identified and the ICT output does not identify any potential impacts:

Based on the information submitted the area may contain populations or critical habitat of Northeastern bulrush. It has been determined that the following adverse impacts could potentially occur as a result of installation of one or more of the conservation practices listed above:

POTENTIAL ADVERSE IMPACTS
No known potential adverse impacts are provided by installation of this practice(s).

This indicates that even though there is a high probability that species exist or are likely to exist within the AOI, the practice(s) selected have no potential adverse affect to the species. Planners should then proceed to subsequent sections of the report to review any other relevant information.

AVOIDANCE MEASURES AND REQUIRED CONDITIONS

It is critical that planners and landowners understand that the strategies listed in section II are required in order to receive Federal technical and financial assistance. Avoidance measures are strategies to avoid or minimize the risk for adversely affecting a species or habitat in a given location. In most instances, if the planner fully complies with NRCS standards, the additional measures outlined in the ICT are easily met. There are approximately thirty different avoidance strategies that the ICT could require for any given practice.

If avoidance measures are required, these strategies must become part of the specifications for conservation practices (i.e. the conservation plan). How these specifications are provided to the client is up to the conservation planner. One obvious strategy would be to incorporate them into the customization of job sheets used in conservation planning. These measures could be listed in the "Additional Recommendations" or "Additional Notes" sections of those documents. At a minimum, planners may provide a copy of the ICT report to the landowner with a thorough explanation of the meaning. Planners should also document how these strategies were provided to clients in either the conservation assistance notes and/or the CPA-52.

It is important to realize that in most cases where species are indicated as potentially present by the ICT, as long as the practices are installed in existing, active agricultural lands the affects of the conservation practice are usually minimal and avoidance measures are easily implemented. In fact many of the required strategies are consistent with the general criteria found in the conservation practice standard. It is more likely for potential adverse affects to occur when practices involve land clearing activities, creation of new agricultural lands, large areas of tree removal, aquatic habitat manipulation and broad landuse changes as a result of practice implementation.

Most of the strategies required by the ICT are fairly clear and concise. Typical avoidance measures may require planners to place practices a certain distance away from a critical resource or implement them using only a certain methodology (e.g. mechanical vs. chemical application). The list of additional strategies for practice implementation is found in Section II of the ICT report and is outlined after the following statement:

> *Based on the information submitted, the following strategies are* **REQUIRED** *to be implemented to avoid adverse affects to listed species. The strategies listed below must be incorporated into the conservation plan, layout and/or specifications.*

Planner's Note:

For ease of explanation, the following pages contain mock up examples of alternative strategies and reports. Actual reports may vary in appearance or grouping of recommendations and alternative strategies. As the ICT develops the reporting format will likely change and become more user friendly.

If there are no additional strategies required for a conservation practice(s), the list will simply state: "*No additional strategies are required for this practice.*"

Example

Based on the information submitted, the following strategies are **REQUIRED** to be implemented to avoid adverse affects to listed species. These strategies listed below must be incorporated into the conservation plan, layout and/or specifications.

PRACTICE	REQUIRED ADDITIONAL STRATEGIES FOR PRACTICE IMPLEMENTATION
Alley Cropping (311)	No additional strategies are required for this practice.

Planners may then proceed to the other sections of the report for additional guidance.

If the ICT determines that there are strategies required to be implemented in order to comply with the ESA, the table contains practices in the left column and the required strategy(s) are listed immediately adjacent to the practice. All strategies must be implemented as applicable.

Example

Based on the information submitted, the following strategies are **REQUIRED** to be implemented to avoid adverse affects to listed species. These strategies listed below must be incorporated into the conservation plan, layout and/or specifications.

PRACTICE	REQUIRED ADDITIONAL STRATEGIES FOR PRACTICE IMPLEMENTATION
Fence (382)	The use of construction equipment, green concrete or other pollutants including fuel and oil products within flowing streams or natural waterbodies during construction activities is prohibited. Plan and install appropriate measures to minimize sediment and turbidity during practice installation or application.
	During practice installation, implement measures to ensure that the transport of excess nutrients, sediments, pesticides or toxic substances to streams, wetlands and adjacent waterbodies does not occur.
	The placement or application of this practice shall not be within **50 feet** of streams, wetlands or other permanent waterbodies.
	The removal or impacts to existing trees, shrubs or other native vegetation shall be avoided to the extent possible.
	Mechanized or chemical site preparation methods shall not be used in areas that are not existing hayland, pastureland or cropland.

In this example the conservation practice Fence (382) would have five requirements or avoidance measures that are necessary for implementation.

Some strategies restrict implementation to certain areas or landuses. Occasionally, the practice may list multiple landuses in separate strategies. For example, a certain practice may be listed as able to be implemented in existing cropland only. The following strategy may state that the practice is only allowed to be implemented in existing hayland, pastureland or any grassland system. On the surface this may seem contradictory. What this refers to is all the landuses to which the practice may be applied. Therefore, the practice is considered able to be implemented in any of those identified existing landuses and is not limited to one or the other exclusively. In this instance, the only landuse to which this practice would be excluded is forestland.

Example

Based on the information submitted, the following strategies are **REQUIRED** to be implemented to avoid adverse affects to listed species. These strategies listed below must be incorporated into the conservation plan, layout and/or specifications.

	REQUIRED ADDITIONAL STRATEGIES FOR PRACTICE IMPLEMENTATION
Prescribed Grazing (528)	This practice shall be designed and implemented to ensure that no adverse water quality impacts to surface and groundwater from ~~**animal wastes**~~ shall occur.
	Practice shall only be installed or applied to existing actively managed cropland and cropping systems.
	Practice shall only be installed or applied in existing actively managed pasture, hayland or other grassland system (this includes farm headquarters areas).

There are a few required additional strategies for practice implementation that require special consideration. There are instances when one of the required additional strategies for practice implementation could require that planners consult with USFWS. This would occur when listed species are identified and the ICT recognizes a practice-species combination(s) that could have significant potential adverse affects to listed species and those affects would be unavoidable. In these instances consultation would be required.

Example

Based on the information submitted, the following strategies are **REQUIRED** to be implemented to avoid adverse affects to listed species. These strategies listed below must be incorporated into the conservation plan, layout and/or specifications.

PRACTICE	REQUIRED ADDITIONAL STRATEGIES FOR PRACTICE IMPLEMENTATION
Pond (378)	**Coordination or consultation with USFWS is required.** Contact the NRCS State Biologist to initiate the consultation process.

In this example a pond has the potential to adversely affect this listed species or habitat. Therefore, consultation would be required. Planners should then attempt to utilize alternative practices to avoid these potential adverse impacts and run additional queries through the ICT and review the results. If alternative practices are not available or yield the same result, consultation is required. This message may often occur with other avoidance strategies identified for other conservation practices. If this message is received this means that the impact is not avoidable and the determination is now May Adversely Affect (MAA). Note that the final effect may be listed as Not Likely to Adversely Affect (NLAA); but the avoidance strategy specifically requires consultation as identified in the bold font on the report. Therefore consultation is required.

Example

PRACTICE	REQUIRED ADDITIONAL STRATEGIES FOR PRACTICE IMPLEMENTATION
Prescribed Grazing (528)	The placement or application of this practice shall not be within **50 feet** of streams, wetlands or other permanent waterbodies.
	Practice shall only be installed or applied in existing actively managed pasture, hayland or other grassland system (this includes farm headquarters areas).
Pipeline (516)	During practice installation, implement measures to ensure that the transport of excess nutrients, sediments, pesticides or toxic substances to streams, wetlands and adjacent waterbodies does not occur.
	Practice shall not be implemented or installed directly in wetlands or streams that contain TEC species. Refer to the Field Office Technical Guide (FOTG) Section II for a list of streams and other resources that contain TEC species.
Pond (378)	**Coordination or consultation with USFWS is required.** Contact the NRCS State Biologist to initiate the consultation process.

It has been determined that if all the required additional strategies listed above are implemented, the activities described are considered **Not Likely to Adversely Affect** (NLAA) **Northeastern bulrush** or it's habitats. No further consultation under the Endangered Species Act is required with the U.S. Fish and Wildlife Service. Proceed with planning and implementation. Maintain a copy of this report as documentation of investigation according to NRCS policy. If practices are added, quantities, locations or other significant changes occur prior to installation, conservation planners must revise and resubmit this data. **NOTE: If any of the required strategies listed above cannot be implemented, or the strategy specifically requires coordination or consultation with USFWS the proposed practice is determined as May Adversely Affect (MAA) as a direct or indirect result of implementation and will then require consultation with U.S. Fish and Wildlife Service.**

If consultation is required and unavoidable, planners should contact the State Biologist. By NRCS policy only the State Biologist is allowed to conduct official consultation. This should be an extremely rare occurrence in West Virginia. If conservation planners encounter this situation, the field office protocol is as follows:

- Stop the planning process and contact the State Biologist with a copy of the report and photos if appropriate
- Determine any other available alternatives to avoid consultation via site visit or other appropriate method

OR

Complete the **ICT Review Request** form with the additional information such as photos. This will fulfill the requirements outlined above. A Digital ICT Review Request form may be found on the ICT website or in section II of the field office technical guide.

If the issue cannot be resolved and consultation is required:

- Obtain decision maker's signature on CPA-52-b
- Schedule site visit with NRCS/USFWS/landowner or decision maker
- State Biologist enters into formal or informal consultation with USFWS as applicable
- USFWS issues biological opinion
- A take permit is issued or other appropriate action as determined by the consultation process

Planner's Note:

For initial versions of the ICT the protocol outlined above may vary. As the ICT is refined (as during early versions) the statistical thresholds of some species models may be modified or adjusted. USFWS, WVDNR and NRCS will coordinate to determine the appropriate model dynamics and if the requirements are reasonable and appropriate. During this time if this situation is encountered no other alternatives are available and consultation is required planners should:

- *Contact the State Biologist with a copy of the report and photos if appropriate with a summary of the plan and conservation practices requiring consultation*
- *State Biologist confers with other agencies*
- *Other agencies and NRCS make appropriate recommendation based on location data and other evidence (proceed with planning, consultation, etc)*
- *NRCS and USFWS revise ICT if appropriate*
- *Other action as appropriate (formal consultation, etc)*

Inspection for Existing Mussel or Darter Populations for Stream Crossings

Another alternative strategy that requires special considerations are for stream crossings and some streambank protection measures. These activities have the potential to be some of the most beneficial NRCS conservation practices for many aquatic species particularly native freshwater mussels. However, if crossings are improperly located or improperly designed in streams that contain mussels they can be detrimental. Frequently, crossings are planned in an area of the stream where the streambed is the most stable and able to withstand frequent livestock or equipment traffic. Unfortunately, these are frequently favorable areas to find existing mussel populations. For that reason, it was decided to require inspection by trained personnel prior to implementation. (578) Stream Crossing and Streambank and Shoreline Protection are the typical conservation practices which require inspection prior to implementation.

The ICT will provide an avoidance strategy requiring the planner to have the area inspected prior to implementation as follows:

Example

Based on the information submitted, the following strategies are **REQUIRED** to be implemented to avoid adverse affects to listed species. These strategies listed below must be incorporated into the conservation plan, layout and/or specifications.

PRACTICE	REQUIRED ADDITIONAL STRATEGIES FOR PRACTICE IMPLEMENTATION
Prescribed Grazing (528)	The placement or application of this practice shall not be within 50 feet of streams, wetlands or other permanent waterbodies.
	This practice shall be designed and implemented to ensure that no adverse water quality impacts to surface and groundwater from animal wastes shall occur.
	Practice shall only be installed or applied to existing actively managed cropland and cropping systems.
	Practice shall only be installed or applied in existing actively managed pasture, hayland or other grassland system (this includes farm headquarters areas).
Stream Crossing (578)	Inspection for mussel or darter populations by qualified NRCS, USFWS, WVDNR staff or approved contractors is required prior to practice installation; and project must be constructed in a manner to avoid any existing populations.

For the current version of the ICT, if this avoidance strategy is encountered, the interim protocol will be as follows:

1. Complete the **ICT Review Request** form with the additional information such as photos. This will fulfill the requirements outlined below. A Digital ICT Review Request form may be found on the ICT website or in section II of the field office technical guide.

OR

1. Contact the State Biologist via email with the ICT report name, any pertinent information concerning site description and location map
2. Biologist will make an appropriate recommendation which may include one or more of the following:
    a. digital photography of the new proposed site
    b. schedule a site visit
    c. contact USFWS and determine action
    d. other appropriate action
3. The State Biologist will coordinate with the USFWS and the NRCS field office of the action and final determination in writing via email. Once approved, the email should be filed with other ESA compliance information.

In the future, USFWS and WVDNR will provide training to select area and field staff to become certified to make a determination of avoidance for this practice; thus eliminating the need to provide notification to the State Biologist or contact with USFWS for every encounter. In the interim select NRCS employees will be certified to provide inspection on stream crossings.

Practices within 2.5 Miles of a Maternity Colony

Some practices planned within two and one-half miles of an Indiana bat maternity colony require special consideration. Practices that require tree removal and are implemented in close proximity to documented roost sites will trigger this alternative. The ICT will determine the proximity of the planned practices to known maternity colonies and provide a required alternative strategy that may instruct the planner to contact the USFWS prior to implementation or "precautionary" coordination to avoid these sensitive sites. These areas occur in the southern coalfields, northern panhandle and throughout Pendleton Pocahontas and Randolph counties.

Example

Based on the information submitted, the following strategies are **REQUIRED** to be implemented to avoid adverse affects to listed species. These strategies listed below must be incorporated into the conservation plan, layout and/or specifications.

PRACTICE	REQUIRED ADDITIONAL STRATEGIES FOR PRACTICE IMPLEMENTATION
Firebreak (394)	This practice occurs within 2.5 miles of an Indiana bat maternity colony. The USFWS must be contacted prior to any tree removal activities. In addition, any tree clearing associated with this practice shall be conducted between November 15th and March 31st. Trees with a diameter at breast height (dbh) of less than 5 inches may be removed anytime during the year. No trees that exhibit exfoliating bark characteristics such as shell and shag bark hickories and white oak species; or dead and dying trees with exfoliating bark, broken tree tops, splintered or split areas; trees with cavities or hollowed areas shall be removed.

For the current version of the ICT, if this avoidance strategy is encountered, the interim protocol will be as follows:

1. Complete the **ICT Review Request** form with the additional information such as photos. This will fulfill the requirements outlined below. A Digital ICT Review Request form may be found on the ICT website or in section II of the field office technical guide.

OR

2. The NRCS Field office will provide the following information (preferably digitally) to the State Biologist for forwarding to the USFWS:

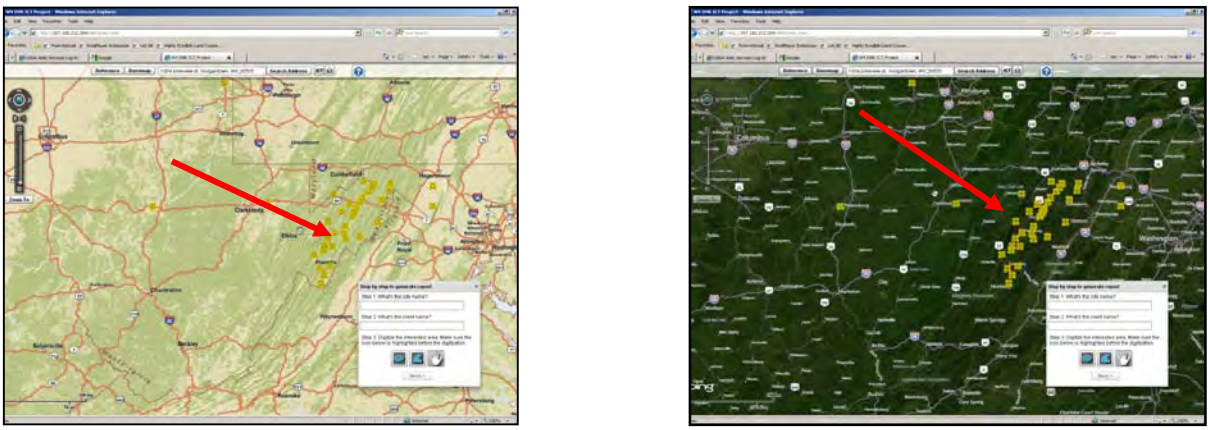
a. Copy of the USGS topographic map where AOI is located
b. Brief narrative description of the action
b. Copy of the ICT report
c. Amount and acreage of tree removal
d. Stand type (species and approximate average age) of trees
e. Approximate time of implementation
f. Any photos of area if available and feasible
g. Any other relevant info requested or appropriate

The State biologist will then forward the information to the USFWS for review along with ICT Review Request the form completed.

Working with Eagles

Eagles are taken into consideration, located and given a final effect determination in the same way as other species by the ICT. The recommendations provided by the ICT are derived from the National Eagle Management Guidelines. This is a set of broad national recommendations used to advise landowners, land managers, and others who share public and private lands with bald eagles when and under what circumstances the protective provisions of the Bald and Golden Eagle Protection Act may apply to their activities.

When launching the ICT application the user will notice the map of West Virginia and some icons scattered throughout the state boundary. These icons indicate the known nesting locations of bald eagles in West Virginia. These symbols may be turned off or dimmed by pressing the Reference button in the ICT toolbar. The default setting is enabled.



Two views of initial ICT launch screens showing two different maps. Note the scattered yellow icons indicating known eagle nesting sites. These may be turned off by using the reference button.

The icons scale as the map is scaled and will be seen on the ICT report. This is important because the eagle management guidelines are written based on the assumption that the nest location is known. If an AOI is selected that is within a specified distance of a known eagle nest, the ICT will require additional strategies for eagles. These strategies are designed to avoid audible or visual disturbance during the nesting season.

If a query is performed and the report indicates that an eagle nest has the potential to be disturbed, the map should be utilized to determine the exact location of the nest. Strategies required by the ICT will reference distances from the location indicated on this map. This location should be transposed (where feasible) to any conservation plan maps. The strategies required should then be incorporated into plan specifications.

Note the location of the eagle nest on the map at right. In this example the known nest is just south of the AOI. These icons may be turned off by selecting the "reference" button and un-checking the bald eagle slider.

Most often the avoidance measures consist of altering the timing of practice installation. Since breeding and nesting occurs in the winter and early spring the implementation of common practices should not be affected. For the most part, conservation practices that are not directly in sight lines or cause audible disturbance within a specified distance from nests need not alter their implementation. The most drastic alternative strategy is the creation of some permanent or temporary buffer between the practice and nest site using trees or other natural or man-made barrier. This type of avoidance measure should be extremely rare.

Final Effect Determination

The final effect determination is the final result of the query. Planners do not have the ability to directly alter the final determination of any query. The final results are based on individual analysis of conservation practices in conjunction with a particular species or habitat. There are four possible final effect determinations of any query:

- No Finding (N/A)
- No Effect (NE)
- Not likely to Adversely Affect (NLAA)
- May Adversely affect (MAA)

These are official ESA determinations where species are likely to exist.

No Finding (N/A) – This result occurs when there is an absence of listed species or habitats in or near the AOI. This result is not an official determination under the ESA; it is simply a method of identifying that there were no critical resources identified. In these instances the final effect determination in section II of the report yields the following statement.

Example

PRACTICE	REQUIRED ADDITIONAL STRATEGIES FOR PRACTICE IMPLEMENTATION
N/A	No alternative strategies are required for this practice
No further consultation under the Endangered Species Act is required with the U.S. Fish and Wildlife Service. Proceed with planning and implementation. Maintain a copy of this report as documentation of investigation according to NRCS policy. If practices are added, quantities, locations or other significant changes occur prior to installation, conservation planners must revise and resubmit this data. **NOTE: If any of the required strategies listed above cannot be implemented, or the strategy specifically requires coordination or consultation with USFWS the proposed practice is determined as May Adversely Affect (MAA) as a direct or indirect result of implementation and will then require consultation with U.S. Fish and Wildlife Service.**	

This is likely the most common response provided by the ICT. Upon receiving this information, planners should file the report along with the CPA-52 worksheet as supporting information of NEPA compliance and proceed with planning. No further ESA considerations are required. However, if listed species are encountered during implementation or practices change prior to installation the query should be resubmitted.

No Effect (NE) – This determination results when a species is likely to be present; but the practices entered have no potential adverse or beneficial effect to that species or habitat.

Example

PRACTICE	REQUIRED ADDITIONAL STRATEGIES FOR PRACTICE IMPLEMENTATION
Alley Cropping (311)	No alternative strategies are required for this practice
It has been determined that if all of the required additional strategies listed above are implemented, the activities are considered to have **No Effect** (NE) on **Northeastern bulrush** or its habitats. No further consultation under the Endangered Species Act is required with the U.S. Fish and Wildlife Service. Proceed with planning and implementation. Maintain a copy of this report as documentation of investigation according to NRCS policy. If practices are added, quantities, locations or other significant changes occur prior to installation, conservation planners must revise and resubmit this data. **NOTE: If any of the required strategies listed above cannot be implemented, or the strategy specifically requires coordination or consultation with USFWS the proposed practice is determined as May Adversely Affect (MAA) as a direct or indirect result of implementation and will then require consultation with U.S. Fish and Wildlife Service.**	

Therefore, there will be no additional strategies listed nor will there be potential benefit for NE determinations. While this determination is possible, it will likely be somewhat rare in West Virginia.

Not Likely to Adversely Affect (NLAA) – This determination results when a species or habitat is likely to be present and the practices entered into the ICT have an effect on the species either beneficially or adversely. This determination occurs when either:

- all the listed avoidance strategies are able to be implemented; and/or
- when no avoidance strategies are identified, but the practice(s) provide identified benefits to a species or habitat.

Example

It has been determined that if all the required additional strategies listed above are implemented, the activities described are considered **Not Likely to Adversely Affect** (NLAA) **Northeastern bulrush** or it's habitats. No further consultation under the Endangered Species Act is required with the U.S. Fish and Wildlife Service. Proceed with planning and implementation. Maintain a copy of this report as documentation of investigation according to NRCS policy. If practices are added, quantities, locations or other significant changes occur prior to installation, conservation planners must revise and resubmit this data. **NOTE: If any of the required strategies listed above cannot be implemented, or the strategy specifically requires coordination or consultation with USFWS the proposed practice is determined as May Adversely Affect (MAA) as a direct or indirect result of implementation and will then require consultation with U.S. Fish and Wildlife Service.**

Planners should ensure that if additional strategies are identified, they are capable of being implemented and agreed to by the client. Also, ensure that one or more of the required additional strategies does not specifically require consultation with USFWS. The report should then be attached to the CPA-52 and filed as supporting documentation of compliance with ESA and NEPA. If one or more practices do require consultation the determination is May Adversely Affect (MAA) and planners should follow the procedure for alternative practices or the consultation process.

Determinations of NLAA will most likely be more common in some areas of the state while very infrequent in others. Planners should not be alarmed if they encounter this determination. Often times this determination may mean that conservation of listed species is being accomplished as opposed to potential destruction of habitat. Review the strategies listed and determine if they are reasonable and appropriate. If there are still concerns about practice impacts or requirements contact the NRCS State Biologist.

May Adversely Affect (MAA) –This determination results when a proposed practice is likely to adversely affect a listed species or its habitat as a direct or indirect result of implementation. Usually consultation with USFWS is required. The ICT does not provide a direct response for May Adversely Affect (MAA). This determination occurs when one or more of the conservation practices submitted:

- specifically requires consultation; or
- one or more of the required strategies cannot be implemented.

Example

PRACTICE	REQUIRED ADDITIONAL STRATEGIES FOR PRACTICE IMPLEMENTATION
Prescribed Grazing (528)	The placement or application of this practice shall not be within 50 feet of streams, wetlands or other permanent waterbodies.
	This practice shall be designed and implemented to ensure that no adverse water quality impacts to surface and groundwater from animal wastes shall occur.
	Practice shall only be installed or applied to existing actively managed cropland and cropping systems.
	Practice shall only be installed or applied in existing actively managed pasture, hayland or other grassland system (this includes farm headquarters areas).
Pipeline (516)	During practice installation, implement measures to ensure that the transport of excess nutrients, sediments, pesticides or toxic substances to streams, wetlands and adjacent waterbodies does not occur.
	Practice shall not be implemented or installed directly in wetlands or streams that contain TEC species. Refer to the Field Office Technical Guide (FOTG) Section II for a list of streams and other resources that contain TEC species.
Pond (378)	**Coordination or consultation with USFWS is required.** Contact the NRCS State Biologist to initiate the consultation process.

It has been determined that if all the required additional strategies listed above are implemented, the activities described are considered **Not Likely to Adversely Affect** (NLAA) **Northeastern bulrush** or it's habitats. No further consultation under the Endangered Species Act is required with the U.S. Fish and Wildlife Service. Proceed with planning and implementation. Maintain a copy of this report as documentation of investigation according to NRCS policy. If practices are added, quantities, locations or other significant changes occur prior to installation, conservation planners must revise and resubmit this data. **NOTE: If any of the required strategies listed above cannot be implemented, or the strategy specifically requires coordination or consultation with USFWS the proposed practice is determined as May Adversely Affect (MAA) as a direct or indirect result of implementation and will then require consultation with U.S. Fish and Wildlife Service.**

This determination should be relatively rare in West Virginia. Less than seven percent of all possible species-practice combinations require coordination and/or consultation. In addition, the combinations that automatically require consultation are infrequently utilized at the field or area office level in day-to-day planning activities. If planners receive this determination **do not panic**. In most instances consultation can be avoided at the field level through alternative avoidance methods, alternative practice selection, informal consultation or some other painless method. In addition, there is a good chance that there are alternative measures, situations and methods that have not been anticipated during the development of the ICT. It will take some time to encounter these situations and determine alternatives that avoid consultation. It is fully anticipated that as the ICT evolves additional alternative strategies will be included, deleted and/or revised.

If the result of the ICT report results in a May Adversely Affect (MAA) determination, the planner is to stop the planning process and contact the State Biologist immediately. Until a resolution can be established no further financial or technical assistance may be offered to the client. The exception to this policy applies to HEL and WC planning only. In this case, NRCS should inform the landowner that protected species may be impacted and continue to provide planning assistance. The landowner is solely responsible for obtaining any permits. Planners should document how the information was presented to the landowner in the technical assistance notes.

Multiple Species Findings and Determinations

While unlikely, it is possible that a query could identify multiple species in an AOI which are potentially affected by conservation practices in different ways thus yielding different final determinations. Some practices a user may select and submit could result in a No Effect (NE) on one or more of the species identified; while others could potentially be adverse or beneficial to one or more of those species. All species that were identified as potentially affected will appear on the report in section I; however the final determination and report will reflect only the specie(s) that are likely to be affected (i.e. NLAA).

For instance a query could find harperella, shale barren rockcress and running buffalo clover on or near an AOI. A user has planned three practices. None of those practices have any affects (beneficial or adverse) on either shale barren rockcress or harperella. However, running buffalo clover is affected by one or more of the conservation practices. Therefore, running buffalo clover will be listed as Not Likely to Adversely Affect (**NLAA)** in the final effect determination section of the report. All running buffalo clover avoidance strategies, benefits, etc. will be identified throughout the remainder of the report. Separate determinations for shale barren rockcress or harperella are not provided by the ICT even though those species were identified and evaluated as No Effect (**NE**).

Because practices have different effects to different listed species, a change to one or more of those practices that previously had no effect may now require an avoidance strategy(s). For this reason it is important for planners to understand that an ICT query must be resubmitted if planned conservation practices change during the planning process or prior to implementation. This is especially true if the query resulted in multiple species findings.

Management Considerations

Management considerations are identified in section III of the ICT report. They are provided to alert the user to other species that may affect a planned practice, special habitats or other relevant information within or near the AOI. **This information is not required to be implemented by the client.** As the ICT evolves, this section will provide a wider variety of information and will include species of concern identified by the State of West Virginia and other information. Section III of the ICT reports all have the following statement:

> *The following are considerations that may be used to support conservation activities, but are not required to avoid adverse effects. When possible utilize these recommendations during conservation planning of this area:*

Not every report will have management recommendations listed. In fact, most reports will not have them. If there are management recommendations, the section then lists a table with the item and the strategy identified in the adjacent column. If there are no management recommendations the report will list the table as N/A and None. If management recommendations are listed they may typically appear as follows:

Example

SUBJECT	MANAGEMENT RECOMMENDATION
Fence (382)	Larger than required buffers are more beneficial to the species and may aid in its recovery.

In this example, this statement would remind the planner and client that a fence used as a buffer and located some distance away from a particular resource would be more beneficial if the buffer was increased; and practices that provide buffers in general are beneficial.

Some practices could list a management recommendation suggesting inspection of the area for evidence of existing or historic populations as shown below.

Example

SUBJECT	MANAGEMENT RECOMMENDATION
Prescribed Grazing (528)	If possible, qualified personnel should inspect for evidence of existing or historic populations of TEC species prior to installation or application.

This recommendation is not required but provided to inform planners that as a courtesy the agencies are requesting more information or require additional data concerning a particular species.

Planner's Note:

NRCS is working to establish a direct protocol for field offices to have inspections should coordination of benefits be desired. Until such time as that protocol is established, this should be a very low priority for field offices. If investigation is still desired or necessary, contact the State Biologist to determine the appropriate method and points of contact. In most instances this should be the partner biologist. Planners should always obtain the permission of the landowner to allow investigation. Written authorization from the client for investigation is not required as it is for consultation; but it should at least be documented in the assistance notes.

Currently the recommendations given are very broad NRCS conservation practice-based statements. As the ICT evolves, this section will list additional State species of concern or other special interest species that could be relevant to the AOI. This section may also identify concurrent management techniques that may benefit those species as well.

Example

SUBJECT	MANAGEMENT RECOMMENDATION
Golden-winged warbler	This area could support the golden-winged warbler. Uneven aged timber management and early successional habitat above 2800 feet in elevation favors habitat for this rare songbird. Contact the WVDNR for information or NRCS for conservation practices that are beneficial to its habitat.

Potential Benefits

Section IV of the report lists possible benefits that could be realized by the conservation practices submitted. A benefit to a species is defined in this document as an advantage to a listed species in either habitat suitability or potential population growth; and occurring within a designated habitat and utilized for a specific purpose. Examples of purposes may include things such as livestock exclusion or establishment of riparian areas. Not every benefit may be applicable to every instance of a species-practice combination. Planners will need to determine which benefits apply to which circumstances. Sometimes multiple benefits may apply to a single practice, while other times no benefits may apply. Because planning conditions and resource concerns are so varied, the benefits are expressed as generalized statements and leave their interpretation open to the user. It is

important to remember that potential benefits are contingent upon proper application and maintenance of practices according to the NRCS standard and implementation of any avoidance measures.

Example

PRACTICE	POTENTIAL BENEFITS PROVIDED BY THIS ACTIVITY	QTY.
Prescribed Grazing (528)	This practice may be beneficial if it is installed for the purpose of reducing or eliminating animal wastes, sediment, pesticides, or other pollutants from a surface water resource such as a stream or wetland containing TEC species or potentially occupied habitat.	28 ac.
	This practice may be beneficial if it facilitates exclusion of people, vehicles, livestock or equipment to resources used by the species or potentially occupied habitats of TEC species.	
	This practice may be beneficial if planned and conducted in coordination with WVDNR and/or USFWS for benefit of the species. Contact the NRCS State Biologist and/or USFWS to initiate these efforts. **(optional)**	
Fence (382)	This practice may be beneficial if it facilitates exclusion of people, vehicles, livestock or equipment to resources used by the species or potentially occupied habitats of TEC species.	1,125 ft.
	This practice may have a beneficial effect on potentially occupied habitats or TEC species when installed for the purpose of restoration and/or management of aquatic restoration (e.g. riparian, streams and wetlands).	
	This practice may be beneficial if planned and conducted in coordination with WVDNR and/or USFWS for benefit of the species. Contact the NRCS State Biologist and/or USFWS to initiate these efforts. **(optional)**	
Watering Facility (614)	This practice may be beneficial if it facilitates exclusion of people, vehicles, livestock or equipment to resources used by the species or potentially occupied habitats of TEC species.	1 no.

In the example above four practices provide potential benefits. Depending upon the purpose of the conservation plan the benefits listed may or may not apply.

Keeping Track of Benefits

The current version of the ICT does not track benefits or record them in such a way as to recall them later to create a collated report. This is due in part to the fact that the data is not retained other than in the generated report; and the data generated is not in a suitable format to generate a meaningful report. Presently there is no way to determine under what circumstances practices are applied without a substantial increase in user input. In future versions of the ICT this could be overcome. NRCS planners are under no requirement to track the benefits reported by the ICT. However, it is suggested that local field offices have an awareness of broad benefits realized within their area of responsibility.

Another useful part of the ICT is the ability to determine if conservation practices planned and applied through farm bill programs actually do provide benefits to listed species or species of concern. This question is quite common in most Farm Bill ranking criteria. In the past, this question was subjective and often not applied uniformly among field offices, districts or throughout the State. Using the benefits listed in the ICT report, it may

be possible to determine if practices actually do have an effect on listed species; and would be appropriate to utilize as justification for giving ranking points to a particular Farm Bill application.

Coordination of Benefits

Benefit coordination refers to situations in which the effects of a practice have been identified, and coordination with USFWS is encouraged but is not required. This assures the practice is implemented to attain the maximum benefit to the species. Situations where practices are implemented for the specific benefit of a species (i.e. habitat restoration) are examples of when coordination should be implemented. Planners and clients may also simply choose to coordinate benefits with the USFWS to gain additional knowledge or include other partner resources. This benefit statement is left very broad to cover the majority of these scenarios. In these cases the following statement will appear in section IV of the ICT report:

> *This practice may be beneficial if planned and conducted in coordination with WVDNR and/or USFWS for benefit of the species. Contact the NRCS State Biologist and/or USFWS to initiate these efforts.*

Coordination of benefits may mean different things depending on the specie(s) and circumstances involved. Recommendations from the USFWS can be widely varied and may range from recommending a practice implementation timeframe to simply requesting notification of when efforts are being conducted in a certain area.

In most instances the statement means that there could be potential benefits if the practice was installed using special considerations or resources that the USFWS possesses (e.g. the actual population locations, species natural history knowledge, etc.). Additionally, it may refer to the desire of the USFWS to coordinate efforts to protect, enhance and restore habitats for a particular area or species. This allows multiple agencies to participate and track efforts to conserve federal listed species and move ultimately toward delisting. If possible, all conservation efforts affecting federal listed species should be coordinated with partner agencies whenever possible. Some examples of benefit coordination may include:

- tracking of conservation activities in a particular area (i.e. watershed) of concern or critical habitat by an agency
- reporting of progress toward delisting and implementation of a recovery plan item by USFWS
- recommended timing or notification of practice implementation
- specific modification to a specification
- investigation of the area by USFWS biologist to determine local habitat/populations
- additional technical assistance by endangered species and/or partner biologists
- providing existing population location information
- additional/potential financial assistance
- educational benefits

If this statement is listed on the report in conjunction with required consultation with the USFWS from section II, it means that the overall benefit to the species will likely be beneficial in most circumstances as a result of consultation.

Planner's Note:

NRCS and USFWS will establish a direct protocol for field offices to contact the USFWS should coordination of benefits be desired. Until such time as that protocol is established coordination of benefits should be a very low priority for field offices. If coordination is still desired or necessary, contact the State Biologist to determine the appropriate method and points of contact. In most instances this should be the USFWS Partners for Fish and Wildlife Biologist. Planners should always obtain the permission of the landowner to coordinate benefits prior to contacting USFWS. Written authorization from the client for coordination of benefits is not required as it is for consultation; but it should at least be documented in the assistance notes.

ICT REPORT DECISION PROCESS

Below are two methods to interpret what the ICT reports. The first is a step-by-step narrative that allows the user to follow through the process based on what the report says. The second is a decision tree diagram that illustrates the same process using a flow chart.

STEP-BY-STEP NARRATIVE

Upon receipt of an ICT report, determine if the practices selected have an effect upon a listed species or habitat using the following method:

STEP 1 – Review Section I of the report and choose the correct response below.

STEP 1a - If the ICT report Section I states:

Based on the information submitted, there appear to be no known populations or critical habitat of any federally listed species.

Print the ICT report. Mark the resource as **"**Not Present" on the CPA-52 and continue planning. If desired, the client may choose to implement any other special recommendations provided in Section III of the ICT report. At this point the planner may **STOP**

STEP 1b - If Section I of the ICT report indicates that there are listed species or designated habitats present; and one or more practices that could have potential adverse impacts to those species or habitats **proceed to Step 2**.

STEP 2 - Determine if there are any required additional strategies outlined in the ICT output Section II:

STEP 2a - If there are no required additional strategies for practice implementation and the determination is No Effect (**NE**); print the ICT report and/or save to the client folder. Mark the resource as "No Effect. See Attached Documentation" on the CPA-52 and continue planning. If available, the client may choose to implement any other special recommendations provided by the ICT. **STOP**

STEP 2b - If there are no required additional strategies for practice implementation the determination is Not Likely to Adversely Affect (**NLAA**). Print the ICT report and/or save to the client folder. Mark the resource as "See Attached Documentation" on the CPA-52 and continue planning. If available, the client may choose to implement any other special recommendations provided by the ICT. Document any benefits as appropriate. **STOP**

STEP 2c - If **there are** required additional strategies for practice implementation AND all of the additional strategies can be implemented, the determination is Not Likely to Adversely Affect (**NLAA**). Print the ICT report and/or save to the client folder. Mark the resource as "See Attached Documentation" on the CPA-52 and continue planning. Ensure that the ICT guidance is included in the conservation plan to avoid adverse affects. If available, the client may choose to implement any other special recommendations provided by the ICT. Document any benefits as appropriate. **STOP**

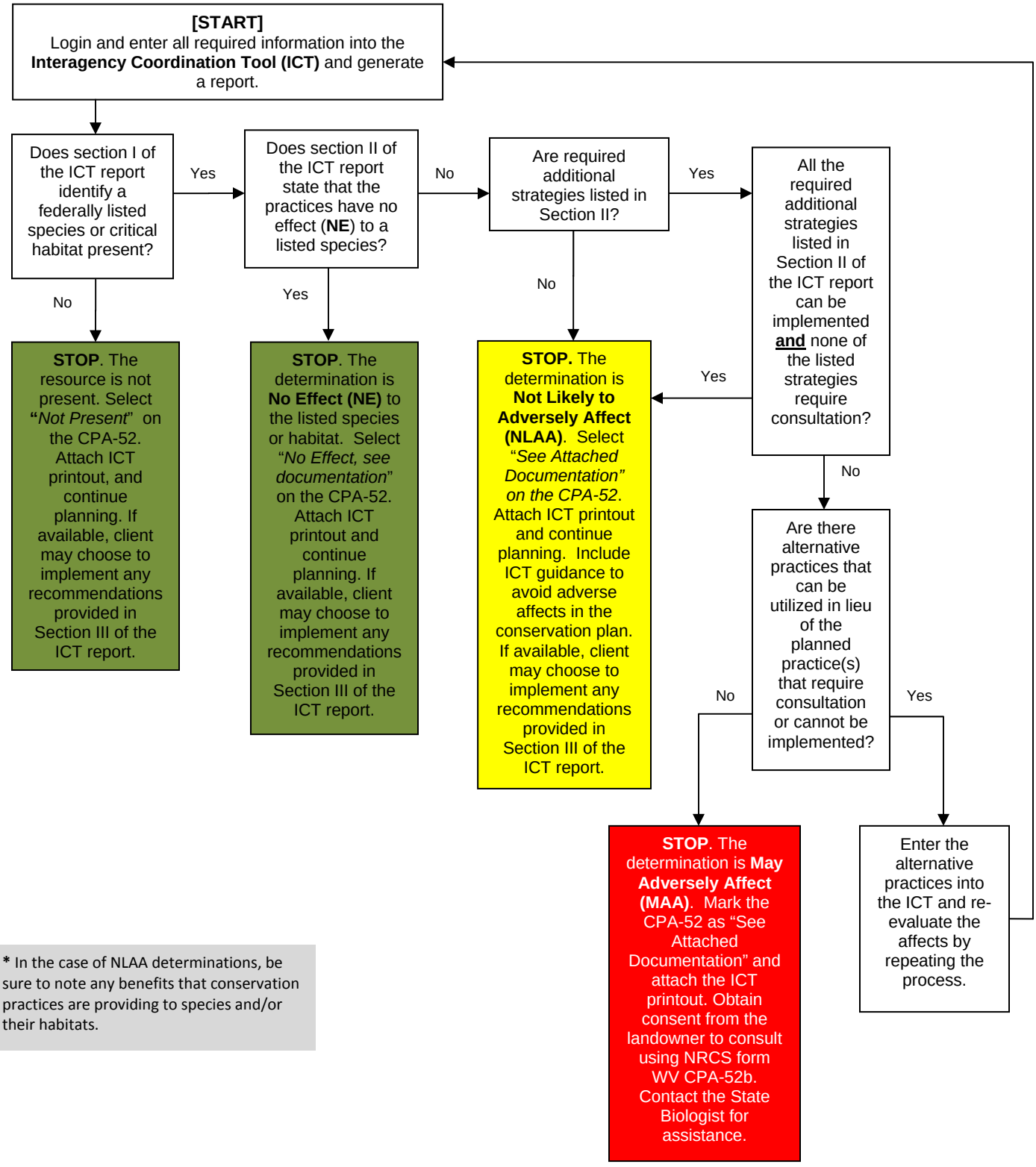
Step 2c - If **there are** required additional strategies for practice implementation AND any of the avoidance measures or required conditions cannot be implemented, the planner should determine if alternative practices can be installed in lieu of the planned practice(s). If there are alternative practices,

repeat Steps 1and 2 to re-evaluate the effects in the ICT. If no alternative practices are available and the impacts are unavoidable the determination is May Adversely Affect (**MAA**). Print the ICT report. Mark the CPA-52 as "See Attached Documentation" and attach the ICT printout. Contact the State Biologist to initiate the consultation process. Obtain consent from the landowner to consult using form NRCS WV CPA-52b. **STOP**

Step 2d - If the ICT indicates that **there are** listed species or designated habitats present and a practice(s) selected requires coordination and/or consultation with USFWS the determination is May Adversely Affect (**MAA**). The planner should determine if impacts could be avoided by using alternative practices. If there are alternative practices, repeat Steps 1and 2 to re-evaluate the effects in the ICT. If no alternative practices are available or the impacts are unavoidable, mark the CPA-52 as "See Attached Documentation" and print the ICT report. Note that the determination is MAA in the conservation assistance notes and on the ICT printout. Attach the ICT printout to the CPA-52. Contact the State Biologist to initiate the consultation process. Obtain consent from the landowner to consult using WV form CPA-52b. **STOP**

NOTE: If consultation or coordination is required, suspend planning until recommendations are made and agreed upon by the client. Obtain permission to initiate the consultation process from the client using WV form WV CPA-52b. If the client declines to consent to consultation or follow the results of consultation, discontinue planning and document in the case file.

ICT REPORT DECISION DIAGRAM



***** In the case of NLAA determinations, be sure to note any benefits that conservation practices are providing to species and/or their habitats.

For HEL and WC planning only, NRCS should inform the landowner if protected species may be impacted and continue to provide planning assistance. The landowner is responsible for obtaining any permits.

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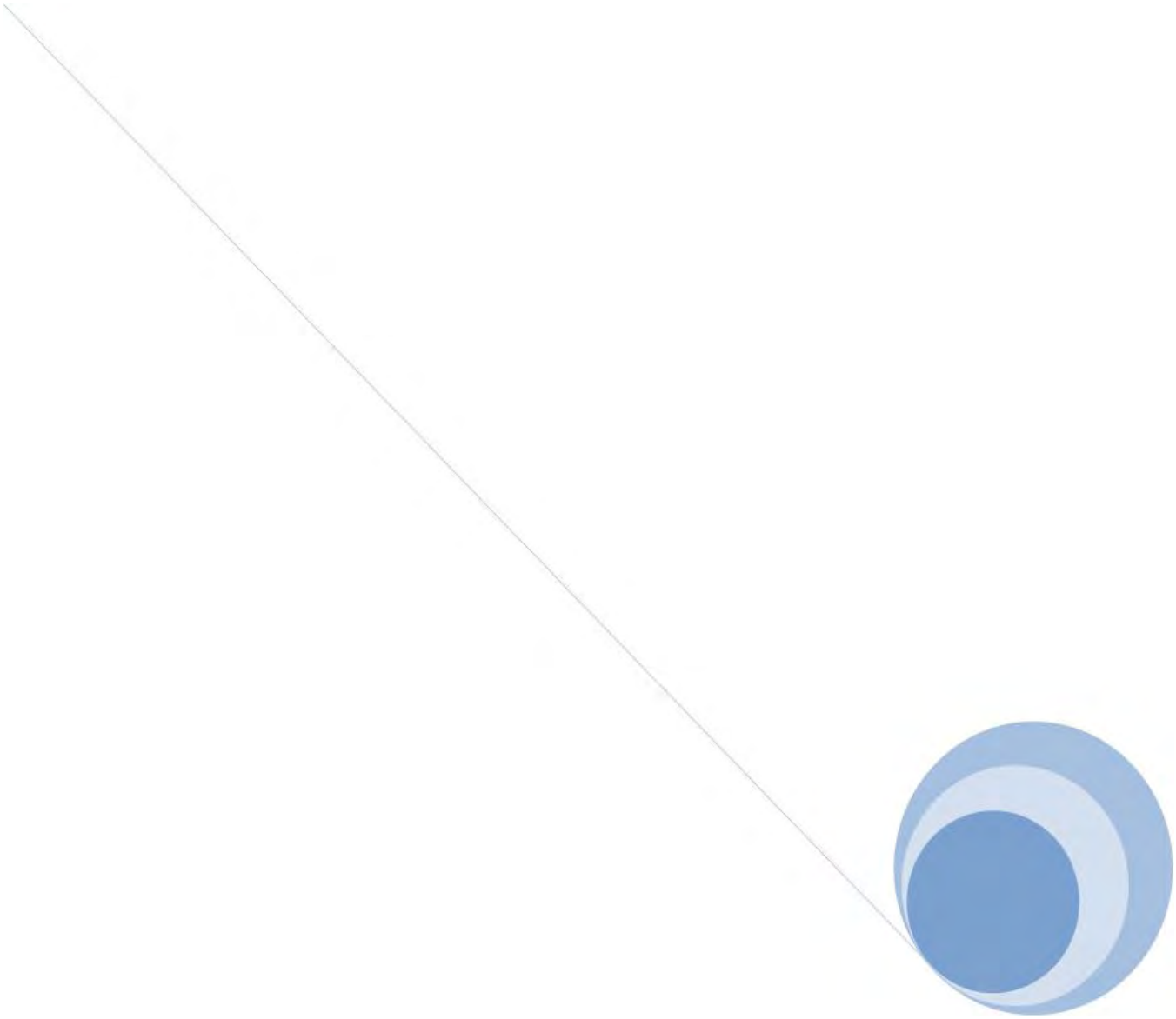

V. ICT ASSISTANCE

The following section provides other sources of information that are available to planners in order to seek assistance when planning in areas that contain listed species or habitats. Many of these sources are also available online and/or in NRCS technical references.

Additional Sources of Information

In addition to training materials and consultations with USFWS and WVDNR biologists, consult the following sources for information on threatened and endangered species:

The **West Virginia NRCS FOTG** is available at http://www.nrcs.usda.gov/technical/efotg/. Refer to Section II of the West Virginia FOTG.

NatureServe Explorer – NatureServe Explorer is a collection of species conservation information and data that is provided by State natural heritage programs and other conservation organizations. (Available at http://www.natureserve.org/explorer/)

WVDNR Natural Heritage and Wildlife Diversity Program –The primary responsibility is to conserve the State's nongame wildlife and their habitats. It also conducts an ongoing statewide ecological inventory of rare plant and animal species, wetlands and other ecological communities. The program identifies unique natural areas and serves as a clearinghouse for general information on the State's natural history. (Available at http://www.wvdnr.gov/wildlife/endangered.shtm)

U.S. Fish and Wildlife Service Threatened and Endangered Species Fact Sheets – These documents provide detailed information concerning T&E species life histories and species descriptions. Fact sheets for most species are currently in development. (Available at http://www.fws.gov/endangered/pubs/index.html) *See also exhibits section of this document.*

Threatened and Endangered Species List West Virginia (NRCS) – This document provides generalized locations of the federal-listed T&E plants and animals that planners in West Virginia would most likely encounter. This list is available in Section II of the FOTG http://www.nrcs.usda.gov/technical/efotg/. *See also exhibits section of this document.*

USFWS Species Recovery Plans – These documents are species specific reports outlining distribution, biology and recovery strategies of Federal-listed species occurring in West Virginia. (Available in Section II of the FOTG http://www.nrcs.usda.gov/technical/efotg/)

The **Bald Eagle Management Guidelines** website available at:
http://www.fws.gov/northeast/EcologicalServices/eagle/guidelines

Sensitive Streams and Streams Containing Mussels in West Virginia – Lists the West Virginia streams in which freshwater mussel populations are known to occur. This list is available in Section II of the FOTG http://www.nrcs.usda.gov/technical/efotg/. - *See also Exhibits section of this document.*

Nationwide Permits for the State of West Virginia – Lists all nationwide permits applicable to West Virginia from both Districts of the US Army Corps of Engineers. They are available in Section I of the Field Office Technical Guide under the Section entitled "Laws".

West Virginia NRCS Conservation Practice Effects on Threatened, Endangered, Candidate and Eagle Species for Planning and Program Implementation – is the official result of the programmatic consultation on which the ICT is based. No changes are made to ICT results unless recorded within this document first. The document outlines the practice-species (aka the matrix) combinations and avoidance measures that were agreed upon during consultation. It is available in a printable format in Section II of the WV FOTG at http://www.nrcs.usda.gov/technical/efotg/.

ESA Training Material – The material provided for training purposes including the Power Point Presentation used to train field office personnel on the use of the ICT entitled *The Interagency Coordination Tool (ICT) – A Tool for compliance with the Endangered Species Act and the Bald and Golden Eagle Protection Act for West Virginia NRCS employees.*

AGENCY CONTACTS

1. Contact one of the following individuals first for assistance in utilizing or interpreting the results of the ICT. Select the individual closest to your field office location. **NOTE: Contact one of these individuals for assistance prior to contacting the ICT State Administrator.**

NRCS East & South Areas	
John Moore WVDNR/NRCS Partner Biologist 223 N. Main Street Moorefield, WV 26836	Phone: **(304) 530-2826** Email:Lee.Haggerty@wv.usda.gov
Idun Guenther WVDNR/NRCS Partner Biologist RR2, Box 51B Buckeye, WV 24924	Phone: **(304) 799-4317** Email: Idun.Guenther@wv.usda.gov
NRCS West & South Areas	
Jake Owens WVDNR/NRCS Partner Biologist 2631 5th St. Rd. Huntington, WV 25701	Phone: **(304) 697-6033** Email:Jake.Owens@wv.usda.gov
Noah McCoard WVDNR/NRCS Partner Biologist One Ball Park Dr. McMechen, WV 2 6040	Phone: **(304) 242-0576** Email: Noah.McCoard@wv.usda.gov

2. For issues concerning benefit coordination for specific species and situations contact the NRCS ICT State Administrator and or the following individuals:

State Coordinator Partners for Fish & Wildlife	
John Schmidt US Fish and Wildlife Service 694 Beverly Pike Elkins, West Virginia 26241	Phone: **(304) 636-6586 Ext. 16** Email: John_Schmidt@fws.gov
Endangered Species Biologist	
Barbara Douglas US Fish and Wildlife Service 694 Beverly Pike Elkins, West Virginia 26241	Phone: **(304) 636-6586 Ext. 21** Email: Barbara_Douglas@fws.gov

3. For all other issues concerning account management or ICT metadata and ICT operation issues contact the NRCS ICT State Administrator:

NRCS ICT State Administrator	
Casey Shrader NRCS WV State Biologist 1550 Earl L. Core Road Suite 200 Morgantown, WV 26505	Phone: **(304) 284-7581** Email: Casey.Shrader@wv.usda.gov

For more information regarding listed or rare species; or to report new information in West Virginia visit the West Virginia Division of Natural Resources at http://www.wvdnr.gov.

For information regarding ICT data housing and GIS metadata visit or contact the West Virginia GIS Technical Center at http://wvgis.wvu.edu/index.php

FREQUENTLY ASKED QUESTIONS

1. *How do I know what areas to outline in the ICT?*
2. *Do I have to enter all practices in the ICT; even the ones NRCS is not funding or putting in a contract?*
3. *What if my client cannot or does not want to meet the conditions or requirements of the ICT for a practice?*
4. *How do I count or track benefits that are listed by the ICT?*
5. *Can I use the ICT for purposes other than conservation planning?*
6. *Why is the launch ICT button grayed out even after I have logged in?*
7. *How can I be sure that my client's planning information is secure?*
8. *What proof do I need to document ESA compliance?*
9. *What if I forget my login?*
10. *What should I use as my user name?*
11. *Can I remove old reports from my report list?*
12. *How often is the ICT updated?*
13. *What should I do if I feel there is an error, problem or I feel the application isn't working properly?*
14. *Is the client required to implement management recommendations provided by the ICT?*
15. *Whom do I contact if I want to coordinate species benefits?*
16. *I can't find the area I want to query.*
17. *How often do I need to run queries in the ICT?*
18. *Do I need to contact someone if I receive an NLAA determination from the ICT?*
19. *Why does my report show NLAA and MAA in the printout?*
20. *What happens if the client refuses to implement one or more avoidance or requirement measures?*
21. *Why does the ICT require consultation with USFWS even though the practices are restoring sensitive areas or habitat?*
22. *Can people who are not NRCS clients or program participants (e.g. consultants) request that I investigate an area for the presence of a listed species for them?*
23. *Under what circumstances is it required that I contact the State Biologist?*
24. *If I get a determination that my plan could potentially affect a listed species by applying one or more conservation practices, does it mean that there are populations of listed species or critical habitat on my client's property?*
25. *What are the minimum computer requirements to run the ICT?*
26. *Why does the ICT report state that I can only implement a practice in a landuse (existing cropland) and the following strategy give another landuse (existing pasture/hayland? Which one is correct?*
27. *I can't find the conservation practice that I have planned in the list on practices the ICT?*
28. *How long does it take to receive notification that my report is ready to view?*
29. *Who is the ICT State Administrator?*
30. *Where can I find additional resources like the ICT request form?*

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1. How do I know what areas to outline in the ICT?

Planners should outline the area that is considered during the conservation planning process. Usually this is an entire tract or farm (but not necessarily) and typically follows the client's property boundary. At a minimum the area of interest should contain the areas where conservation practices are planned.

2. Do I have to enter all practices into the ICT; even the ones NRCS is not funding or putting in a contract?

Yes. NRCS policy requires planners to determine the potential affects to federally listed species even those instances where we are not providing financial assistance.

3. What if my client cannot or does not want to meet the conditions or requirements of the ICT for a practice?

The planner has a couple of options. First, if any of the required strategies listed cannot be implemented, or the strategy specifically requires coordination or consultation with USFWS, the proposed practice is determined as May Adversely Affect (MAA) and will require consultation with U.S. Fish and Wildlife Service. If you feel that there may be extenuating circumstances or that the results are in error, you may contact the State Biologist for further guidance.

A second alternative is to develop planning alternatives that avoid practices having an adverse impact to identified species and resubmit the query. For example, instead of constructing a pond for livestock water, perhaps a well or spring development may solve the resource concern and have less or no adverse impacts on listed species.

4. **How do I count or track benefits that are listed by the ICT?**

As of now, benefits to listed species or eagles are not tracked and/or accumulated within the system. Most practices have the potential to be beneficial depending upon how they are implemented. Early versions of the ICT do not contain this functionality. It is left to the end user to determine the beneficial aspect of each practice. Future versions of the ICT will hopefully provide more functionality in this regard.

5. Can I use the ICT for purposes other than conservation planning?

The ICT was developed specifically for NRCS conservation planning. It should not be used for other purposes or by other agencies due to relevance and privacy issues. However, it may provide useful information as a preliminary planning tool to determine where conservation strategies could be more beneficial to listed species on a landscape level. In addition, using the ICT for ranking Farm Bill program applications to determine if plans/contracts would or could benefit listed species is highly encouraged.

6. Why is the launch ICT button grayed out even after I have logged in?

The Launch ICT button is grayed out when you have submitted a report and are awaiting the results from that report. It will not run concurrent reports for a single user at this time.

7. How can I be sure that my client's planning information is secure?

The ICT does not gather, store and transmit any private information. This tool simply compares geospatial polygons with predetermined areas against predetermined criteria through a programmatic agreement. The report generated is not subject to Freedom of Information Act and is not releasable to third parties without prior written approval from the landowner. Refer to section 1619 of the Farm Bill or the privacy sections in the ICT Handbook.

8. What proof do I need to document ESA compliance?

NRCS in West Virginia has entered into a programmatic agreement with the USFWS Elkins Field Office which allows the report generated by the ICT to stand as documentation of compliance with ESA in WV. Until NRCS West Virginia policy can be supplemented in the General Manual, planners should attach a copy of the report printout from the ICT to the CPA-52 (or store it electronically as appropriate). If practices or practice quantities change (significant quantities) planners should resubmit the query.

9. What if I forget my login?

Click the "forgot my login" button, in the ICT homepage, enter your user name and a new password will be emailed to you. Users should then login and change the password.

10. What should I use as my user name?

For consistency, NRCS employees should utilize their first and last name written without a space between names (e.g. johnsmith).

11. Can I remove old reports from my report list?

Not at this time. Previous report query data is shown on the server. Future versions of the ICT may allow editing by administrators to remove or otherwise organize reports once they are printed; or other report management tools may be added. Reports will periodically be purged. Users should print the latest report as the primary document.

12. How often is the ICT updated?

The ICT is updated at least annually through agreement with all agencies. At that time revisions to practices, required strategies and recommendations are also reviewed. NRCS conservation practices may be updated more frequently than annually. Therefore, there may be a period of time where newer practices appear in the Field Office Technical Guide but do not appear in the ICT. The administrator will strive to make this time gap as short as possible. If significant changes occur during the year this schedule may be accelerated.

13. What should I do if I feel there is an error, problem or I feel the application isn't working properly?

Ensure that you have entered the correct planning data and located the correct position within the map. Rerun your query and review the results. If you still feel either there is an error in the program or the results contact (via email) the State Administrator and provide a copy of the report with a detailed description of the issue.

14. Is the client required to implement management recommendations provided by the ICT?

No. Management recommendations (found in Section III of the report) are provided as general information that if implemented would provide additional benefits to the species.

15. Whom do I contact if I want to coordinate species benefits?

The protocol for version 1.0 of the ICT will be to contact the NRCS State Biologist. Protocol for direct contact from the field and area offices will be standardized at a later date and subsequent version of the program. Coordination of benefits (unless in conjunction with consultation) should be a low priority for field offices until the ICT has more fully evolved.

16. I can't find the area I want to query.

There are several ways to locate areas of interest within the tool. If a physical address is known, the user can simply type the address into the address bar located at the top of the map screen and the tool will zoom to the address. The second option is to use the scale tool on the left-hand side of the map. Click "*Zoom*". This allows the user to select areas by city, county, state, and GPS coordinates, etc.

17. How often do I need to run queries in the ICT?

Queries in the ICT should be run at least one time during the conservation planning process when the planner is relatively certain about practice selection and approximate quantities. If quantities significantly change or practice selection is different from those agreed upon with the client, the query should be run again prior to implementation.

18. Do I need to contact someone if I receive an NLAA determination from the ICT?

No. Unless one or more of the alternatives provided by the ICT cannot be implemented or the avoidance measure specifically requires consultation, inspection of the area or notification of the State Biologist.

19. Why does my report show NLAA and MAA in the printout?

The statement in the final determination of effect section provides a determination of effect based on the practices entered and contingent upon the implementation of avoidance strategies. If those avoidance strategies cannot be implemented the final effect determination then becomes MAA.

20. What happens if the client refuses to implement one or more avoidance or requirement measure(s)?

The required strategies listed in Section II of the report were agreed upon measures by NRCS and the USFWS through a programmatic agreement. One solution could be to try alternative practices to avoid any impacts and thus avoid any alternative strategies. Planners and clients should be aware that national NRCS policy states that if a client refuses to implement any of the required strategies, no further technical or financial assistance will be provided by NRCS. Refer to the ICT Handbook regarding the procedure to initiate consultation for more information.

21. Why does the ICT require consultation with USFWS even though the practices are restoring sensitive areas or habitat?

Some NRCS conservation practices have the ability to restore and enhance the habitat for listed species dramatically. However, some of these practices may need to be implemented with special considerations given to the method in which they are applied. Otherwise these same practices may be detrimental to the species or habitat. It would not be practical to incorporate all the varying conditions and strategies into the ICT. As such, some practices require that you contact USFWS through the State Biologist to ensure that proper methods are utilized.

22. Can people who are not NRCS clients or program participants (e.g. consultants) request that I investigate an area for the presence of a listed species for them?

No. The ICT is designed for NRCS conservation planning compliance with the Endangered Species Act. Results produced by the ICT may not be accurate for other activities.

23. Under what circumstances is it <u>required</u> that I contact the State Biologist?

There are four possible instances where the planner would need to contact the State Biologist prior to implementation: 1) if the required strategy provided by the ICT (found in Section II of the report) specifically requires it; 2) if one or more of the required strategies could not be implemented and consultation is required; 3) coordination of benefits or inspection is necessary prior to implementation; or 4) protected resources are encountered during practice implementation.

24. If I get a determination that my plan could potentially affect a listed species by applying one or more conservation practices, does it mean that there are populations of listed species or critical habitat on my client's property?

Not necessarily. The ICT makes a determination based on statistical probability that the habitat is favorable to support a particular species based on a number of factors including the proximity of known populations, suitable habitat, habitat type and extent of the practice among other factors.

25. What are the minimum computer requirements to run the ICT?

The ICT requires an internet connection and an internet browser. It is configured to support Microsoft Internet Explorer version 8.0 and higher. Other browsers or earlier versions of Internet Explorer may not function properly. To view ICT reports Adobe Acrobat Reader is required.

26. Why does the ICT report state that I can only implement a practice in a landuse (existing cropland) and the following strategy gives another landuse (existing pasture/hayland). Which one is correct?

This refers to the existing landuses to which the practice may be applied. In this case the practice may be applied to <u>any</u> of the existing landuses shown. Therefore if the practice is being implemented in any one

of those existing landuses, the strategies are considered able to be implemented. This particular avoidance measure(s) are ensuring clients do not create new agricultural lands to implement the practice.

27. I can't find the conservation practice that I have planned in the list of practices on the ICT?

Ensure that the practice is still an active West Virginia NRCS conservation practice; and has not been removed from the Field Office Technical Guide. Ensure that the name of the practice has not been changed. Practices are listed alphabetically in the ICT. New practice standards that are listed in the Field Office Technical Guide may not appear instantaneously in the ICT. Practices within the ICT are updated at least annually. The administrator will strive to make this time gap as short as possible. If this is encountered, contact the State Biologist to determine an interim effect determination for new practices.

28. How long does it take to receive notification that my report is ready to view?

The length of time required to receive notification that your query is complete is relatively short (usually within five minutes). However, this time varies depending upon the complexity of the plan, the number of potential habitats, the number of ongoing requests, etc. If a user has not received a report within 24 hours contact the State Administrator for assistance.

29. Who is the ICT State Administrator?

The NRCS ICT State Administrator is Casey Shrader. Contact at Casey.Shrader@wv.usda.gov .

30. Where can I find additional resources like the ICT request form?

On the left hand side of the ICT homepage, click on the link entitled "Additional Resources" to see some specific forms. Some resources are also available in Section II of the Field Office Technical Guide.

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VI. GLOSSARY

Planners may encounter the following terms either in this document or when working with federal listed species and the ICT.

Actively Managed Lands - Land receiving ongoing management treatments which include, but are not limited to: grazing, tillage, crop rotation, fertilization, mowing, weed control, etc. (i.e. lands are not cleared to utilize this practice).

Adverse Impact – The result of implementation of a project or practice that negatively affects a federally listed habitat or species.

Agricultural Lands – Lands used primarily for the production of food and fiber. They usually include landuses such as pasture, hayland, cropland and forestlands.

Area of Interest (AOI) – The boundary outlined and submitted by the planner to inquire the ICT about species, habitats and the effects of conservation practices on them.

Avoidance Measure – See **Avoidance Strategy.**

Avoidance Strategy – A method of installing a conservation practice that avoids or minimizes the risk of adverse impacts to Federal-listed species or their habitats. Avoidance measures and avoidance strategies are equivalent in meaning in this document and are often used interchangeably. (See also **Reasonable and Prudent Alternatives**)

Bald and Golden Eagle Protection Act (BGEPA) – A federal law protecting golden and bald eagles from harm or harassment.

Bald Eagle Nesting Dates – Nesting dates include various activities including egg laying, incubation, hatching and rearing young. Eagle nesting dates vary by geographic region, but in West Virginia the dates are as follows: Eastern Panhandle February 1- June 30; and for the rest of WV March 1 through June 30.

Candidate Conservation Agreement with Assurances (CCA) – a formal agreement between the USFWS and one or more parties to address the conservation needs of proposed or candidate species, or species likely to become candidates, before they become listed as endangered or threatened. The participant voluntarily commits to implementing specific actions that will remove or reduce the threats to these species, thereby contributing to stabilizing or restoring the species so that listing is no longer necessary. If species are listed in the future the landowners in CCA agreements are protected from future restrictions imposed due to listing.

Candidate Species – Any species of fish, wildlife, or plant which has been determined to be candidates for listing under Section 4 of the Endangered Species Act of 1973 (amended) and is being considered for threatened or endangered status.

Consent to Consult – NRCS must obtain the permission of the landowner to consult with the USFWS to determine a course of action when planned conservation practice installation may have an adverse affect on listed species or their habitats. NRCS must obtain consent from the landowner using WV form CPA-52b.

Conservation Practice – A scientifically based methodology prescribed to landowners based on a set of minimum criteria (standard) and applied in a specific way to conserve or protect natural resources.

Conservation Practice Extent – The reach that a particular conservation practice will be utilized within a specific region, area or planning unit.

Conservation Practice Unit – The amounts in which a conservation practice is measured. Examples would include acres, number, feet, miles and cubic yards.

Consultation – The ESA regulates federal agencies, requiring them to ensure that their activities are "not likely to jeopardize" listed species or their habitats: Each federal agency shall ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such. To make this decision, the federal agency "consults" with FWS or NMFS. The "consultation" process is described in 50 C.F.R. Part 402, and the federal agencies have published an Endangered Species Consultation Handbook. Consultation has several steps. First, the agency asks the FWS whether a listed species "may be present" in the area. If so, the agency prepares a "biological assessment" to determine the impact. Next, FWS reviews the information and prepares a "biological opinion". If it finds the proposed action "not likely to jeopardize" the plant or animal (a "no jeopardy" opinion), it must specify the impact of any "incidental take" of the species, necessary mitigating measures, and conditions that should be imposed on the activity. If the FWS issues a "jeopardy" opinion, it must also propose reasonable and prudent alternatives that would not violate the ESA.

Coordination of Benefits – In the context of the ICT, coordination refers to situations in which the USFWS has identified the effects of the practice, but coordination with the agency is strongly encouraged (however not required) to assure the practice is implemented to attain the maximum benefit to the species. Situations in which practices are being implemented for the specific benefit of a species (i.e. habitat restoration) are an example of when coordination should be implemented. In some instances this term is used along with consultation. This indicates that although consultation is required, the overall benefit to the species may likely be beneficial under most circumstances.

CPA-52 – The NRCS worksheet utilized to document the environmental evaluation. See **Environmental Evaluation (EE)**

CPA-52b Form – The WV NRCS standard form utilized to document landowner consent and provides permission by the client to formally consult with outside agencies.

Critical Habitat – Specific geographic areas, whether occupied by listed species or not, that are determined to be essential for the conservation and management of listed species, and that have been formally described in the Federal Register.

Cropland - Land used primarily for the production of field crops or orchard crops alone or in association with sod crops. Any lands used to produce a planted crop by tilling of the soil including no-till and similar methods used to produce food or fiber.

Eagle Nesting Season - Eagle breeding season occurs in West Virginia in February through June.

Endangered Species - The classification provided to an animal or plant in danger of extinction within the near future throughout all or a significant portion of its range.

Endangered Species Act (ESA) – Protects plants and animals that are listed by the federal government as "endangered" or "threatened." Section 7 applies not to private parties but to federal agencies, but it covers their issuing permits for private activities, such as § 404 permits issued by the Corps of Engineers to people who want to do construction work in waters or wetlands. Specifically, § 7 imposes an affirmative duty on federal agencies to ensure that their actions (including permitting) are not likely to jeopardize the continued existence of a listed species (plant or animal) or result in the destruction or modification of critical habitat.

Environmental Evaluation (EE) - When NRCS provides planning assistance, field offices must at a minimum conduct an EE and document the results on the NRCS CPA-52 worksheet. It is NRCS's policy to develop an EE as part of every planning activity. The EE provides a basic framework for documenting effects on resources and concerns that are important in the U.S. and West Virginia. The finding of the EE determines the level of environmental analysis to be conducted. It is intended to be utilized mainly for conservation planning activities at the field office level and in conjunction with conservation planning assistance notes. However, this EE is suitable for use by RC&D Measure Plans and other special projects. Refer to the Exhibits section of the ICT Handbook.

Farm Headquarters – Lands in agricultural operations that may or may not be used for production, but utilized principally for operation and support of the production of food or fiber.

Federal-Listed Species (TEC) – Species listed under the Endangered Species Act. A species status may be listed as Endangered, Threatened, Candidate or Proposed Candidate, Proposed Endangered, etc.

Fish and Wildlife Service (USFWS) – United States Fish and Wildlife Service. An agency under the U.S. Department of Interior

Formal Consultation - The consultation process conducted when a Federal agency determines its action may affect a listed species or its critical habitat, and is used to determine whether the proposed action may jeopardize the continued existence of listed species or adversely modify critical habitat.

Hayland - Land used primarily for the production of hay, forage, grasses, legumes, or comparatively fine-stemmed forbs cut and cured for later use as livestock feed. (Annual plants planted for hay, and forage crops in short-term rotation are cropland.

Herbicide – See **Pesticide**.

Hibernacula - A secure area, usually a cave or other den area used by hibernating bats and other insects or mammals. Bats typically hibernate in areas of caves and mines where temperatures are cold but stable. Most hibernacula are dark and secluded so as to keep the bats out of harm's way from predators or human disturbance.

Informal Consultation - Under Section 7 of the ESA, Federal agencies must consult with the USFWS when any action the agency carries out, funds, or authorizes (such as through a permit) *may affect* a listed endangered or threatened species. This process usually begins as informal consultation. A Federal agency, in the early stages of project planning requests informal consultation. Discussions between the two agencies may include what types of listed species may occur in the proposed action area, and what effect the proposed action may have on those species. In the case of the ICT, this process has already occurred in the form of a programmatic consultation and agreement.

Interagency Coordination Tool (ICT) – The ICT is a web-based geospatial computer application maintained by the WVDNR Wildlife Diversity and Natural Heritage Program. It allows NRCS employees to outline an area of interest and enter planned practices. Conservation planners are then able to receive information on impacts (both

beneficial and adverse) to TEC species based on that information. In addition, the ICT provides some management recommendations for consideration by the client.

Invasive species – those species that show aggressive properties and are both non-native to the region of interest and cause environmental or economic harm or harm to human health. See also **Noxious or Invasive Species.**

Jeopardy - Under the ESA, jeopardy occurs when an action is reasonably expected, directly or indirectly, to diminish a species' numbers, reproduction, or distribution so that the likelihood of survival and recovery in the wild is appreciably reduced.

Karst Features - Landscape features distinctive of karst terrain, typically, but not necessarily formed by solution processes. They are likely to have some relation to subsurface drainage. They include, but are not limited to caves, sinkholes, swallow holes, springs, seeps, soil pipes, fissures, and carbonate rock outcrops.

Karst Topography - landscape shaped by the dissolution of a layer or layers of soluble bedrock, usually carbonate rock such as limestone or dolomite and containing features such as sinkholes, caves and dissolved areas of bedrock. This landform type is present in West Virginia in parts of the Greenbrier Valley and the eastern panhandle.

Landscape Buffer (eagle) **–** A natural or human made landscape feature that screens eagles from human activity (e.g. strip of trees, hill, cliff, berm, sound wall). – See also **Vegetative Buffer** (eagle).

Management Consideration – a recommendation made by the ICT that if implemented in conjunction with conservation practices may additionally benefit Federal-listed species.

Maternity Colony – congregations of bats in areas where they give birth, raise young and nurse pups. Maternity colonies are often caves where temperatures are warm and stable.

May Adversely Affect – (MAA) – A determination that a proposed practice is likely to adversely affect a listed species or its habitat as a direct or indirect result of implementation. Usually consultation with FWS is required. Planners should contact the NRCS State Biologist to initiate the consultation process.

Measurable Effect (Hydrology) – Some avoidance measures require that no alteration of the existing hydrology. This refers to significant alterations of hydrologic regimes in which aquatic species may depend. A measurable affect to hydrology would include diversion, drainage, pumping, adding or altering the frequency of hydrologic cycles to the point that it measurably affects the amount of water on or off the site. A spring development that collected water for livestock from a wetland and then returned the overflow back into the wetland constitutes an example of no measurable effect.

National Bald Eagle Management Guidelines (EMGs) – a set of national broad recommendations to advise landowners, land managers, and others who share public and private lands with bald eagles when and under what circumstances the protective provisions of the Bald and Golden Eagle Protection Act may apply to their activities. These guidelines are reflected within the ICT recommendations and practice-species matrix. See also **Eagle Nesting Season**.

National Environmental Policy Act – (NEPA) – A law passed by Congress in 1969 and signed into law on January 1, 1970. NEPA makes Federal agencies accountable to the public for the environmental impacts of their actions. The Council on Environmental Quality (CEQ) has written regulations that establish the procedures Natural Resources Conservation Service (NRCS) and other Federal agencies must follow to meet NEPA requirements. These regulations require Federal agencies to follow a systematic process when a Federal action is

proposed. The presence of federal-listed species is one of several categories of resources that the NRCS must evaluate for impacts.

Native - A native species is one that occurs naturally with respect to a particular ecosystem, rather than as a result of an accidental or deliberate introduction into that ecosystem by humans.

Natural Resources Conservation Service (NRCS) – The Natural Resources Conservation Service (formerly the Soil Conservation Service). A Federal agency within the United States Department of Agriculture (USDA) providing leadership in a partnership effort to help America's private land owners and managers conserve their soil, water, and other natural resources.

No Effect (NE) – A determination that installation of a conservation practice(s) will not affect a listed species or its habitat either adversely or beneficially.

Non-Game Wildlife - includes those wildlife species which are not fished, hunted or trapped. More than 80% of West Virginia's wildlife is classified as nongame, including: 299 species of birds, 67 mammals, 46 amphibians, 42 reptiles, 180 fishes, 130 butterflies and thousands of other invertebrates, as well as over 2,800 plant species.

Not Likely to Adversely Affect (NLAA) – a determination that a proposed practice is not likely to cause an adverse affect on a Federal-listed species or its habitat. When an NLAA determination is made, planning may proceed. Conditions are often applied to NLAA determinations. They may be made when the proposed practice is determined that effects on listed species are expected to be discountable, insignificant or completely beneficial. NLAA may also result when the practice can be implemented in a manner that avoids adverse affects on T&E species.

Noxious or Invasive Species - Defined in this document as a community of plants or animals that have exhibited invasive characteristics where the presence of that species is detrimental to, or interfering with the intended plant community or animal's habitat. The State of West Virginia has listed 18 species as noxious. Refer to the Field Office Technical Guide for an additional "advisory" list of invasive plants and animals. These species are not considered native.

Pastureland - Grazing lands composed of introduced or domesticated native forage species that are used primarily for the production of domestic livestock. They receive periodic renovation and/or cultural treatments, such as seeding and planting, fertilization, mowing, weed control, and may be irrigated. They are not in rotation with crops.

Pesticide – Any chemical used to control animal and plant pests.

Potential Benefit – A benefit that may be realized by a practice that occurs within a designated habitat for a TEC species if utilized for a specific purpose. Examples of purposes may include things such as livestock exclusion or establishment of riparian areas.

Programmatic Consultation - Consultation addressing an agency's multiple actions on a program, regional or other basis.

Proposed Species - Any species of fish, wildlife, or plant that is proposed in the Federal Register to be listed under Section 4 of the Endangered Species Act.

Reasonable and Prudent Alternatives - Alternative methods of project or practice implementation, offered in a biological opinion reaching a jeopardy or adverse modification conclusion, that would avoid the likelihood of jeopardy to the species or adverse modification of critical habitat. The avoidance measures within the matrix of species-practice combinations are reasonable and prudent alternatives. See also **Avoidance Strategy**.

Recovery Plan- A document drafted by the USFWS or other knowledgeable individual or group, that serves as a guide for activities to be undertaken by Federal, State, or private entities in helping to recover and conserve endangered or threatened species.

Required Condition – A condition in which the planned practice must be implemented to avoid harm to a listed species. These are analogous to reasonable and prudent measures.

Safe Harbor Agreement - A voluntary arrangement between the U.S. Fish and Wildlife Service and a cooperating non-federal landowner that provide benefits to listed species while giving the landowners assurances from additional restrictions.

Sinkhole - A natural depression or hole in the surface topography caused by the removal of soil and/or bedrock by water. Sinkholes may vary in size from a few feet to several hundred feet in both diameter and depth, and vary in form from soil-lined bowls to bedrock-edged chasms. They may have been formed gradually or suddenly. The terms sinks, swallow holes or swallets are often referred to separately as those features into which a surface stream flows. In West Virginia, there are several areas in which streams flow in and out of these features and are associated with karst topography.

Species of Concern - An informal term that refers to those species which biologists believe might be in need of concentrated conservation actions. Such conservation actions vary depending on the health of the populations and degree and types of threats. At one extreme, there may only need to be periodic monitoring of populations and threats to the species and its habitat. At the other extreme, a species may need to be listed as a Federal threatened or endangered species. Species of concern receive no legal protection and the use of the term does not necessarily mean that the species will eventually be proposed for listing as a threatened or endangered species.

Take (ESA) – Harass, harm, injure or otherwise molest a species listed under the Endangered Species Act.

TEC species – Federally listed plant or animal species that are either Threatened, Endangered or Candidate. See also **Federal – Listed Species.**

Threatened Species - The classification provided to an animal or plant likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

U.S. Fish and Wildlife Service (USFWS) – An agency under the Department of the Interior that is responsible for federally listed species under the Endangered Species Act. The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people.

Vegetative Buffer (eagle**)** – An area surrounding a bald or golden eagle nest that is wholly or largely covered by forest vegetation or other natural ecological characteristics, and separates the nest from human activities.

West Virginia Division of Natural Resources (WVDNR) – the state wildlife agency responsible for fish and wildlife (game and non-game) and other natural resources within the State of West Virginia.

Wildlife Diversity Program and Natural Heritage Program (WDP) – A division within the WVDNR that is responsible for those species listed by the federal government as threatened or endangered, as well as nongame wildlife and their habitats. The Wildlife Diversity Program's primary responsibility is to conserve the state's nongame wildlife resources through the identification and management of nongame species and their habitats. The WDP also seeks to inform and educate the public about the resource, and to enhance the recreational opportunities it provides.

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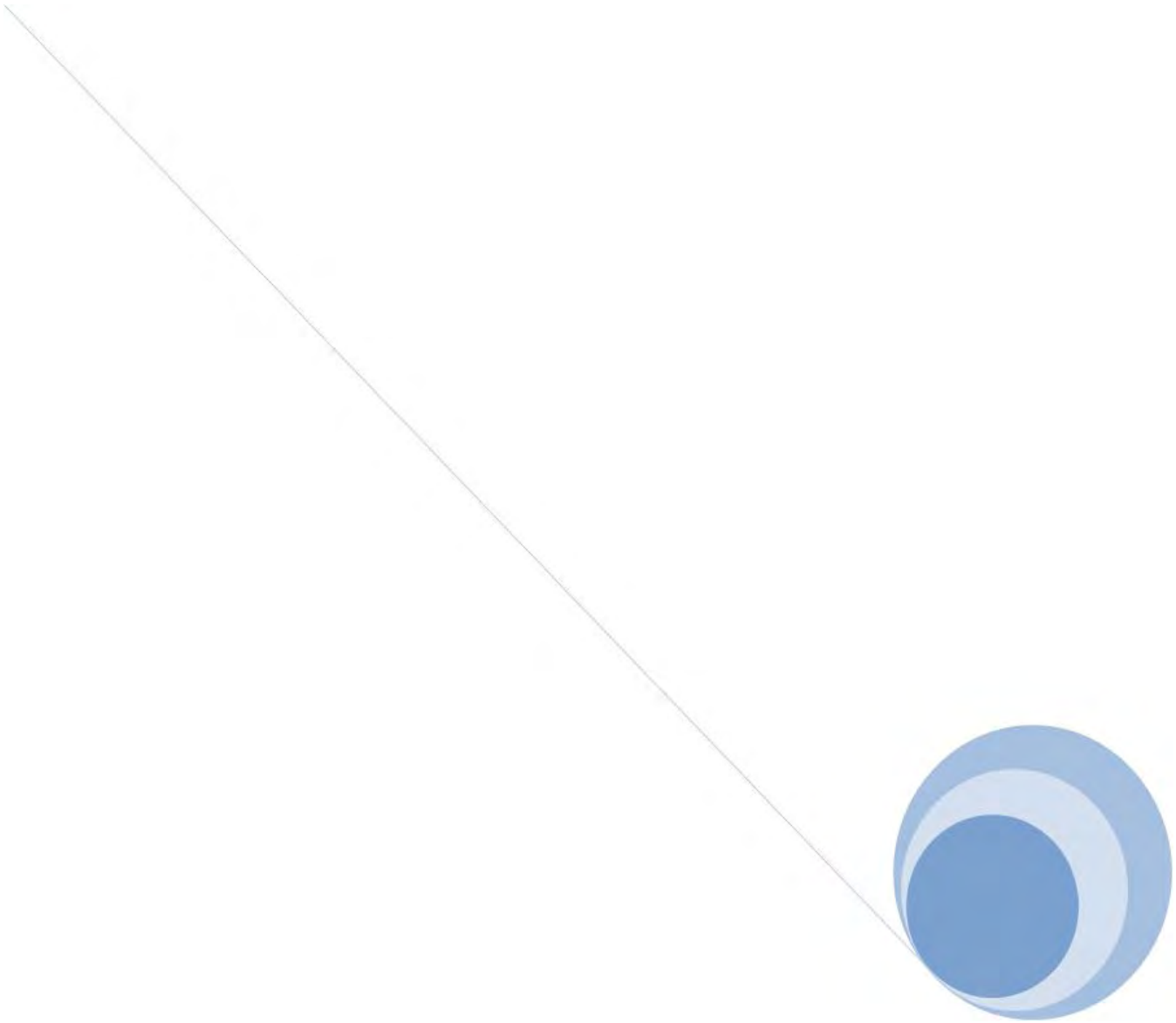

VII. EXHIBITS

Note: Species of Concern are not identified through the ICT. They are included as additional sources of information to planners.

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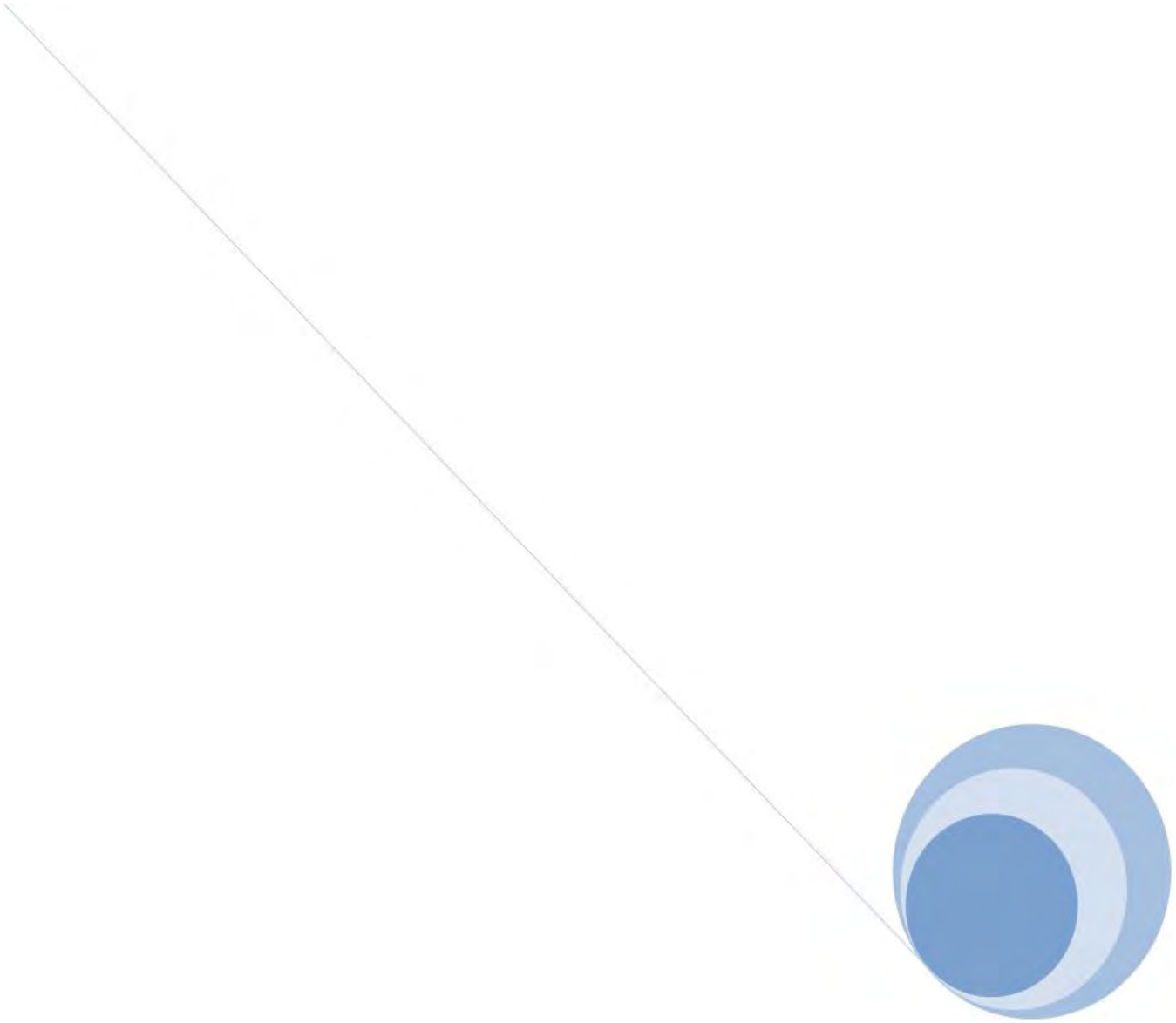

ICT SAMPLE REPORT

Map [Area of Interest]

Inquiry Date: [11/11/11]

Client: [Junior Sample]

County: [Jefferson]

Location: [The old home place]

Practices Submitted for Review:

Pond (378)	1	no.
Fence (382)	1125	ft
Watering Facility (614)	1	no.
Pipeline (516)	256	ft.
Prescribed Grazing (528)	28	ac.

I. POTENTIAL IMPACTS

The area submitted for review may contain critical habitat or populations of Northeastern bulrush. It has been determined that the following adverse impacts could potentially occur as a result of installation of one or more of the conservation practices listed above:

POTENTIAL ADVERSE IMPACTS
There is a potential to adversely affect TEC species by animal waste, livestock, pesticides, sediment, pollutants or various human activities entering into or occurring within or adjacent to, streams, wetlands or other surface waterbodies.
There is a potential to adversely affect TEC species through the manipulation of hydrologic regimes or the alteration of hydrology through diversion, impoundment, removal or flooding.
There is a potential to adversely affect TEC species through direct or indirect crushing, trampling or disturbance by people, livestock, earthmoving, fill or equipment.

II. REQUIRED STRATEGIES & EFFECT DETERMINATION

Based on the information submitted, the following strategies are REQUIRED to be implemented to avoid adverse affects to Northeastern bulrush. The strategies listed below must be incorporated into the conservation plan, layout and/or specifications.

PRACTICE (CODE)	REQUIRED ADDITIONAL STRATEGIES FOR PRACTICE IMPLEMENTATION
Fence (382)	The use of construction equipment, green concrete or other pollutants including fuel and oil products within flowing streams or natural waterbodies during construction activities is prohibited. Plan and install appropriate measures to minimize sediment and turbidity during practice installation or application.
	During practice installation, implement measures to ensure that the transport of excess nutrients, sediments, pesticides or toxic substances to streams, wetlands and adjacent waterbodies does not occur.
	The placement or application of this practice shall not be within **50 feet** of streams, wetlands or other permanent waterbodies.
	The removal or impacts to existing trees, shrubs or other native vegetation shall be avoided to the extent possible.
	Mechanized or chemical site preparation methods shall not be used in areas that are not existing hayland, pastureland or cropland.
Watering Facility (614)	The use of construction equipment, green concrete or other pollutants including fuel and oil products within flowing streams or natural waterbodies during construction activities is prohibited. Plan and install appropriate measures to minimize sediment and turbidity during practice installation or application.
	This practice shall be designed and implemented to ensure that no measurable effect, interruption, removal or manipulation to existing hydrology supporting water dependent TEC species or adjacent aquatic habitat shall occur (e.g. streams, open sinkholes, wetlands, etc.).
	No adverse impacts (including removal) to trees, shrubs and other woody vegetation within a **50 foot** buffer along streams (measured from top of bank) or edge of wetlands shall occur.
	As a result of implementing this practice(s), no adverse impacts (including removal) to trees, shrubs and other woody vegetation within a 50 foot buffer along streams (measured from top of bank) or edge of wetlands shall occur.
Prescribed Grazing (528)	The placement or application of this practice shall not be within **50 feet** of streams, wetlands or other permanent waterbodies.
	This practice shall be designed and implemented to ensure that no adverse water quality impacts to surface and groundwater from **animal wastes** shall occur.
	Practice shall only be installed or applied to existing actively managed cropland and cropping systems.
	Practice shall only be installed or applied in existing actively managed pasture, hayland or other grassland system (this includes farm headquarters areas).
Pipeline (516)	During practice installation, implement measures to ensure that the transport of excess nutrients, sediments, pesticides or toxic substances to streams, wetlands and adjacent waterbodies does not occur.
	Practice shall not be implemented or installed directly in wetlands or streams that contain TEC species. Refer to the Field Office Technical Guide (FOTG) Section II for a list of streams and other resources that contain TEC species.
Pond (378)	**Coordination or consultation with USFWS is required.** Contact the NRCS State Biologist to initiate the consultation process.

It has been determined that if all the required additional strategies listed above are implemented, the activities described are considered Not Likely to Adversely Affect (**NLAA**) Northeastern bulrush or it's habitats. No further consultation under the Endangered Species Act is required with the U.S. Fish and Wildlife Service. Proceed with planning and implementation. Maintain a copy of this report as documentation of investigation according to NRCS policy. If practices are added, quantities, locations or other significant changes occur prior to installation, conservation planners must revise and resubmit this data. **NOTE: If any of the required strategies listed above cannot be implemented, or the strategy specifically requires coordination or consultation with USFWS the proposed practice is determined as May Adversely Affect (MAA) as a direct or indirect result of implementation and will then require consultation with U.S. Fish and Wildlife Service.**

III. MANAGEMENT RECOMMENDATIONS

The following are considerations that may be used to support Northeastern bulrush conservation, but are not required to avoid adverse effects. When possible utilize these strategies during conservation planning of this area:

SUBJECT	CONSIDERATION
Fence (382)	Larger than required buffers are more beneficial to the species and may aid in its recovery.

IV. BENEFITS

If all avoidance and required measures are implemented as outlined in this report, the following practices may beneficially affect Northeastern bulrush:

PRACTICE (CODE)	POTENTIAL BENEFITS PROVIDED BY THIS ACTIVITY	QTY.
Prescribed Grazing (528)	This practice may be beneficial if it is installed for the purpose of reducing or eliminating animal wastes, sediment, pesticides, or other pollutants from a surface water resource such as a stream or wetland containing TEC species or potentially occupied habitat.	28 ac.
	This practice may be beneficial if it facilitates exclusion of people, vehicles, livestock or equipment to resources used by the species or potentially occupied habitats of TEC species.	
	This practice may be beneficial if planned and conducted in coordination with WVDNR and/or USFWS for benefit of the species. Contact the NRCS State Biologist and/or USFWS to initiate these efforts. **(optional)**	
Watering Facility (614)	This practice may be beneficial if it facilitates exclusion of people, vehicles, livestock or equipment to resources used by the species or potentially occupied habitats of TEC species.	1 no.

PRACTICE (CODE)	POTENTIAL BENEFITS PROVIDED BY THIS ACTIVITY	QTY.
Fence (382)	This practice may be beneficial if it facilitates exclusion of people, vehicles, livestock or equipment to resources used by the species or potentially occupied habitats of TEC species.	1,125 ft.
	This practice may have a beneficial effect on potentially occupied habitats or TEC species when installed for the purpose of restoration and/or management of aquatic restoration (e.g. riparian, streams and wetlands).	
	This practice may be beneficial if planned and conducted in coordination with WVDNR and/or USFWS for benefit of the species. Contact the NRCS State Biologist and/or USFWS to initiate these efforts. **(optional)**	
Pond (378)	This practice is considered beneficial if it provides additional habitat in the form of cover (native woody vegetation), pollinating insects (native forbs), or restores natural, light, thermal or hydrologic regimes.	1 no.
	This practice may be beneficial if planned and conducted in coordination with WVDNR and/or USFWS for benefit of the species. Contact the NRCS State Biologist and/or USFWS to initiate these efforts. **(optional)**	

Intended Use: *This document is to be utilized for planning and documenting compliance with NRCS policy, Endangered Species Act, Bald and Golden Eagle Protection Act and some components of the National Environmental Policy Act. It is specific to activities in which NRCS staff is providing individual conservation technical assistance and/or funding under various Farm Bill programs; or for purposes of ranking to enroll in USDA programs. Projects that are larger in scope are not to utilize this methodology and will continue to follow NRCS policy and procedures as stated in GM Title 190, Part 410 - Compliance with NEPA and 190-VI-National Environmental Compliance Handbook (NECH).*

Disclaimer: *The information provided in this report is based on the best current data available to the U.S. Fish and Wildlife Service and the West Virginia Division of Natural Resources. However, errors or gaps in information and data may occur. Therefore planners should always check the site to determine the exact locations or suitability of habitat through on-site analysis. Occurrences of species or habitats could be located within the identified area of interest that is not included in this report. Responses provided by the ICT indicating the absence of species of interest may indicate that the area has not been surveyed or unknown data exists, rather than confirmation that the area lacks critical habitat or species. Verification of this information should always be performed on site. Upon discovery of protected resources or modification to original designs, further coordination may be required. If nesting eagles, Endangered, Threatened or Candidate species or their habitats are identified during implementation or construction activities, immediately cease the activity and contact your agency representative responsible for activities under the Endangered Species Act or Bald and Golden Eagle Act activities. This information is relevant only for the practices/activities identified and does not constitute formal consultation with the USFWS. The information contained herein should not be distributed to third parties without the written consent of the landowner. If you feel the information contained in this report is erroneous please contact the NRCS West Virginia State Biologist at (304) 284-7581.*

NRCS CPA-52

National Environmental Compliance Handbook

U.S. Department of Agriculture Natural Resources Conservation Service NRCS-CPA-52 6/2010 **ENVIRONMENTAL EVALUATION WORKSHEET**	A. Client Name: B. Conservation Plan ID # (as applicable): Program Authority (optional): C. Identification # (farm, tract, field #, etc as required):
D. Client's Objective(s) (purpose):	
E. Need for Action:	G. Alternatives *No Action* √ if RMS ☐ | *Alternative 1* √ if RMS ☐ | *Alternative 2* √ if RMS ☐

Resource Concerns

In Section "F" below, analyze, record, and address concerns identified through the Resources Inventory process. (See FOTG Section III - Resource Quality Criteria for guidance).

F. Resource Concerns and Existing / Benchmark Conditions (Analyze and record the existing/benchmark conditions for each identified concern)	H. Effects of Alternatives *No Action* Amount, Status, Description (short and long term)	√ if does NOT meet QC	*Alternative 1* Amount, Status, Description (short and long term)	√ if does NOT meet QC	*Alternative 2* Amount, Status, Description (short and long term)	√ if does NOT meet QC
SOIL						
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
WATER						
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC

F. Resouce Concerns and Existing / Benchmark Conditions (Analyze and record the existing/benchmark conditions for each identified concern)	H. (continued)					
	No Action		*Alternative 1*		*Alternative 2*	
	Amount, Status, Description (short and long term)	√ if does NOT meet QC	Amount, Status, Description (short and long term)	√ if does NOT meet QC	Amount, Status, Description (short and long term)	√ if does NOT meet QC
AIR						
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
PLANTS						
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
ANIMALS						
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
HUMAN - Economic and Social Considerations						

Special Environmental Concerns: Environmental Laws, Executive Orders, policies, etc.

In Section "I" complete and attach applicable Environmental Procedures Guide Sheets for documentation. Items with a "•" may require a federal permit or consultation/coordination between the lead agency and another government agency. In these cases, effects may need to be determined in consultation with another agency. Planning and practice implementation may proceed for practices not involved in consultation.

I. Special Environmental Concerns (Document compliance with Environmental Laws, Executive Orders, policies, etc.)	J. Impacts to Special Environmental Concerns					
	No Action		*Alternative 1*		*Alternative 2*	
	Status and progress of compliance. (Complete and attach Guide Sheets as applicable)	√ if needs further action	Status and progress of compliance. (Complete and attach Guide Sheets as applicable)	√ if needs further action	Status and progress of compliance. (Complete and attach Guide Sheets as applicable)	√ if needs further action
•Clean Air Act		☐		☐		☐
•Clean Water Act / Waters of the U.S.		☐		☐		☐
•Coastal Zone Management		☐		☐		☐
Coral Reefs		☐		☐		☐
•Cultural Resources / Historic Properties		☐		☐		☐
•Endangered and Threatened Species		☐		☐		☐
Environmental Justice		☐		☐		☐
•Essential Fish Habitat		☐		☐		☐
Floodplain Management		☐		☐		☐
Invasive Species		☐		☐		☐
•Migratory Birds/Bald and Golden Eagle Protection Act		☐		☐		☐
Prime and Unique Farmlands		☐		☐		☐
Riparian Area		☐		☐		☐
•Wetlands		☐		☐		☐
•Wild and Scenic Rivers		☐		☐		☐

K. Other Agencies and Broad Public Concerns	*No Action*	*Alternative 1*	*Alternative 2*
Easements, Permissions, Public Review, or Permits Required and Agencies Consulted.			

K. (continued) Other Agencies and Broad Public Concerns		*No Action*	*Alternative 1*	*Alternative 2*
Cumulative Effects Narrative (Describe the cumulative impacts considered, including past, present and known future actions regardless of who performed the actions)				
L. Mitigation				
M. Preferred Alternative	√ preferred alternative	☐	☐	☐
	Supporting reason			

N. Context (Record context of alternatives analysis)

The significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality.

O. Determination of Significance or Extraordinay Circumstances

Intensity: Refers to the severity of impact. Impacts may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.

If you answer ANY of the below questions "yes" then contact the State Environmental Liaison as there may be extraordinary circumstances and significance issues to consider and a site specific NEPA analysis may be required.

Yes	No	
☐	☐	• Is the preferred alternative expected to cause significant effects on public health or safety?
☐	☐	• Is the preferred alternative expected to significantly effect unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas?
☐	☐	• Are the effects of the preferred alternative on the quality of the human environment likely to be highly controversial?
☐	☐	• Does the preferred alternative have highly uncertain effects or involve unique or unknown risks on the human environment?
☐	☐	• Does the preferred alternative establish a precedent for future actions with significant impacts or represent a decision in principle about a future consideration?
☐	☐	• Is the preferred alternative known or reasonably expected to have potentially significant environment impacts to the quality of the human environment either individually or cumulatively over time?
☐	☐	• Will the preferred alternative likely have a significant adverse effect on ANY of the special environmental concerns? Use the Evaluation Procedure Guide Sheets to assist in this determination. This includes, but is not limited to, concerns such as cultural or historical resources, endangered and threatened species, environmental justice, wetlands, floodplains, coastal zones, coral reefs, essential fish habitat, wild and scenic rivers, clean air, riparian areas, natural areas, and invasive species.
☐	☐	• Will the preferred alternative threaten a violation of Federal, State, or local law or requirements for the protection of the environment?

P. The information recorded above is based on the best available information:

In the case where a non-NRCS person (i.e. a TSP) assists with planning they are to sign the first signature block and then NRCS is to sign the second block as the responsible federal agency for the planning action.

Signature (TSP if applicable)	Title	Date
Signature (NRCS)	**Title**	**Date**

The following sections are to be completed by the Responsible Federal Official (RFO)		
Q. NEPA Compliance Finding (check one) The preferred alternative:		Action required
☐	1) is **not a federal action** where the agency has control or responsibility.	Document in "R.1" below. No additional analysis is required
☐	2) is a federal action that is **categorically excluded** from further environmental analysis **and** there are no extraordinary circumstances.	Document in "R.2" below. No additional analysis is required
☐	3) is a federal action that has been **sufficiently analyzed** in an existing Agency state, regional, or national NEPA document **and** there are no predicted significant adverse environmental effects or extraordinary circumstances.	Document in "R.1" below. No additional analysis is required.
☐	4) is a federal action that has been sufficiently analyzed in another Federal agency's NEPA document (EA or EIS) that addresses the proposed NRCS action and its' effects **and has been formally adopted by NRCS**. NRCS is required to prepare and publish the agency's own Finding of No Significant Impact for an EA or Record of Decision for an EIS when adopting another agency's EA or EIS document. **Note: This box is not applicable to FSA.**	Contact the State Environmental Liaison for list of NEPA documents formally adopted and available for tiering. Document in "R.1" below. No additional analysis is required
☐	5) is a federal action that has **NOT** been sufficiently analyzed or may involve predicted significant adverse environmental effects or extraordinary circumstances and may require an EA or EIS.	Contact the State Environmental Liaison. Further NEPA analysis required.

R. Rationale Supporting the Finding	
R.1 Findings Documentation	
R.2 Applicable Categorical Exclusion(s) (more than one may apply)	

I have considered the effects of the alternatives on the Resource Concerns, Economic and Social Considerations, Special Environmental Concerns, and Extraordinary Circumstances as defined by Agency regulation and policy.

S. Signature of Responsible Federal Official:

Signature	Title	Date

Additional notes

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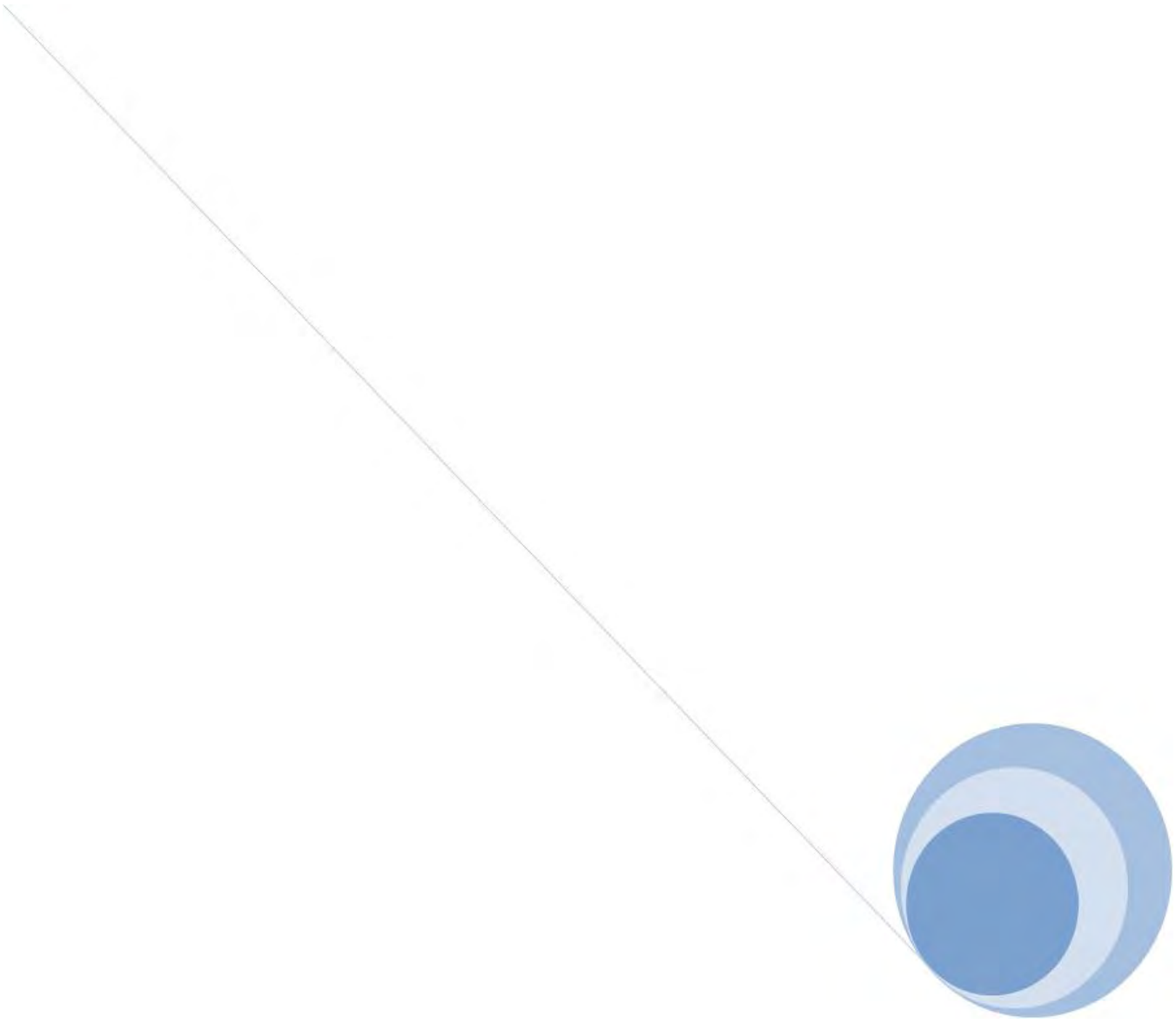

WV NRCS CPA-52b

Available at: http://www.wv.nrcs.usda.gov/intranet/wvforms.html

U.S. DEPARTMENT OF AGRICULTURE Natural Resources Conservation Service	**CONSENT TO CONSULTATION**	WV-CPA-52b 12/2010

Owner: _____ Farm #:_____ Tract#:_____

Check all that apply:

_____**USFWS** – It has been determined that one or more conservation practices planned on your property could adversely affect Threatened, Endangered, Candidate or eagle species or their habitat. In order to ensure compliance with Endangered Species Act (ESA), NRCS is required to consult with the Fish and Wildlife Service to determine a course of action to offset these impacts.

USFS or NPS - The Wild and Scenic River designation and the West Virginia Critical Resource Waters status, requires NRCS to consult with the lead agency for that particular river segment or waterbody. The lead agency for these waterbodies is either the U.S. Forest Service (USFS) or the National Park Service (NPS).

I, _____, have control of said project and/or property, and **give my consent** for NRCS to consult with and/or release pertinent information from my project, conservation plan or construction specifications relating to consultation with the appropriate agency(s) listed above for the purposes of compliance with the ESA, Wild and Scenic River Designations and/or Critical Resource Waters. This does not authorize access to my private property by non-NRCS agencies, groups, or other individuals without my consent. I may cancel this permission at any time by written notice.
[LANDOWNER]

I, _____, have control of said project and/or property and I **choose not to give my consent** for NRCS to consult with and/or release pertinent information from my project, construction specifications or other material relating to consultation with the appropriate agency(s) listed above.
[LANDOWNER]

AND

I understand that failure to provide consent may affect my eligibility to receive USDA benefits. NRCS will provide you no further assistance until the consultation process has been completed.

_____ _____
Landowner Signature Date

_____ _____
Planner's Initials Date

**Planners should provide the landowner a copy of this signed document.*

WV-CPA-52b Page 1 of 1

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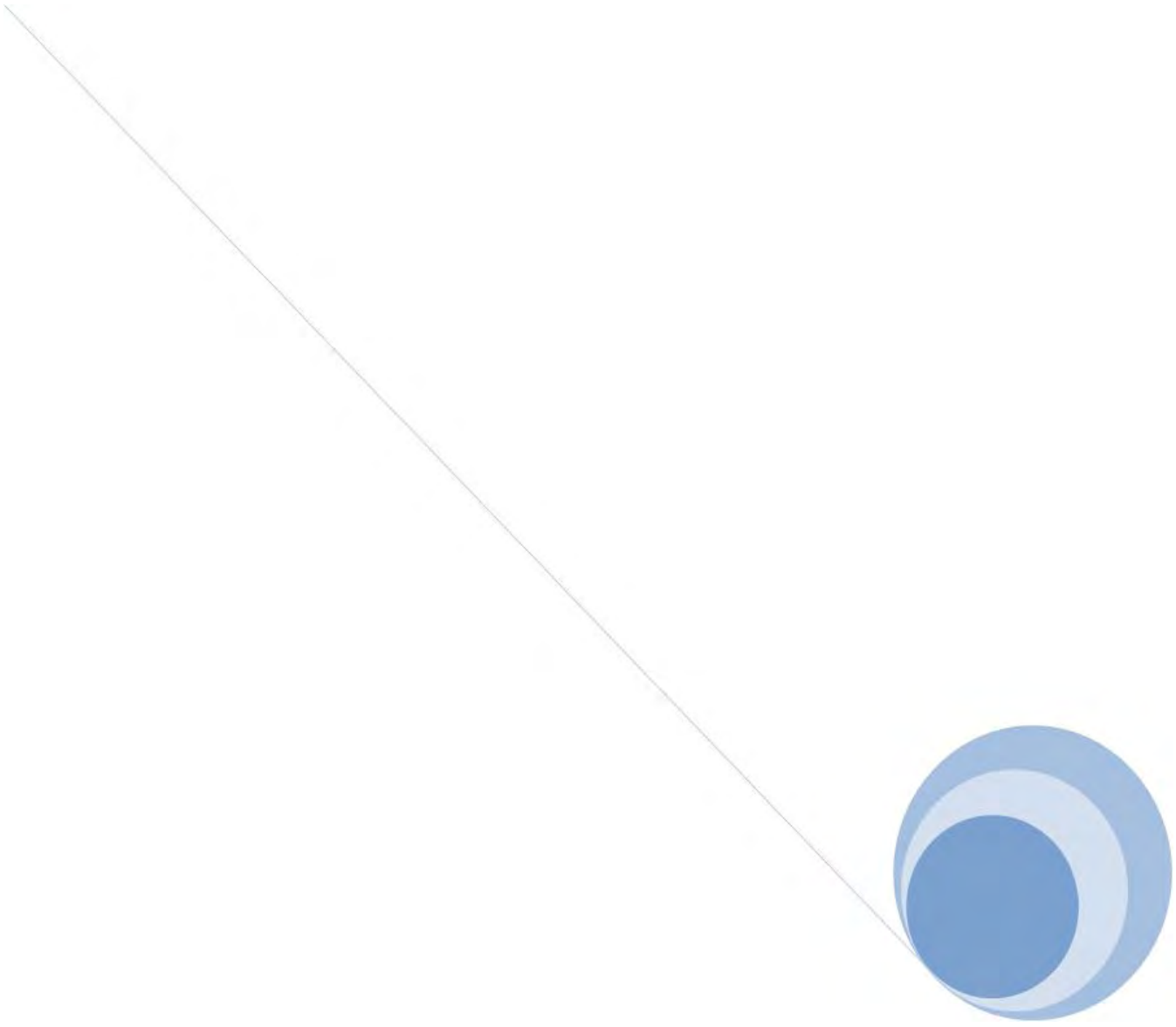

ICT Review Request Form

Request for ICT Threatened, Endangered or Candidate Species Review

(This document is Freedom of Information Act exempt)

County: Date: Planner:

Program: USGS Quad:

A copy of the ICT Report is provided in conjunction with this information. ☐ YES ☐ NO

Area of Interest (AOI)

Unique Area Identifier

Proposed Construction Date

Select up to six planned practices and their extent that could adversely affect listed species as indicated by the *"NRCS Conservation Practice Effects On Threatened, Endangered, Candidate and Eagle Species"* document or refer to the included ICT report.

Planned Practice(s)	Extent	Planned Practice(s)	Extent

List all the T&E species or habitat that may be affected by planned practices. Refer to the ICT report:

Enter the stream name if potential effect(s) are associated with aquatic species. (if applicable)

Stream Name (choose from list or type):

Adjacent Land Use(s): 2 3

Briefly describe the problem(s), conflicts and why the avoidance measures and required conditions can not be implemented (e.g.

When a planned practice may adversely affect a listed species as indicated by the ICT or you are not able to implement an alternative strategy, email this sheet along with digital photos showing the project site and the habitat that may be affected, a copy of the topo/location map showing the project area, and any other supporting information regarding the area in question to the NRCS State Biologist. **Complete all appropriate fields above before sending this form.**

Information In this box to be completed by USFWS and NRCS State Office Biologist

Date Received By State Office Biologist:

Date Forwarded To USFWS: ☐ Not Applicable

Date Of Site Visit (If Required): ☐ Not Applicable

Project has no affect or is not likely to adversely affect isted species or their habitats. ☐ NE

Project is not likely to adversely affect listed species or their habitats, based on NRCS's agreement to implement and including any additional items listed below. ☐ NLAA

If either of the two boxes above are checked, the project is approved and no further section 7 consultation with the USFWS is required. Should project plans change or additional information on listed and proposed species becomes available, this determination may be reconsidered.

Project may adversely affect a listed species, formal consultation with USFWS required. ☐ MAA

See Page 2 For Required Actions To Avoid Adverse Effects and Other Comments:

USFWS Field Biologist — Date

USFWS Field Office Supervisor — Date — FWS #

Casey Shrader
NRCS State Office Biologist — Date

June 2012 1 of 2 ICT Review Request

Required Actions To Avoid Adverse Effects:

Additional Comments:

WV STREAMS REQUIRING SPECIAL CONSIDERATION

Work in any of the following waterbodies requires notification to the U.S. Fish and Wildlife Service due to the presence of endangered and threatened species. *NOTE: CWA and/or WVDNR stream right-of-entry may also be required for certain activities.*

USACE Huntington District Streams	
STREAM	**COUNTY**
Kanawha River (Kanawha Falls to river mile 89.0 near Boomer, WV)	Fayette County
Potts Creek	Monroe County
South Fork of Potts Creek	Monroe County
Elk River	Braxton, Clay and Kanawha Counties
Meathouse Fork Middle Island Creek	Doddridge County
Middle Island Creek	Doddridge, Tyler, and Pleasants Counties
Ohio River	Cabell, Mason and Wood Counties
Gauley River	Nicholas and Fayette County
Bluestone River	Mercer and Summers Counties
Meadow River	Greenbrier and Fayette County
Greenbrier River	Pocahontas and Greenbrier County
Millers Camp Branch of Marsh Fork and associated scrub-shrub wetlands	Raleigh County
Dingess Branch of Marsh Fork and associated scrub-shrub wetlands	Raleigh County
South Fork of Hughes River	Ritchie County
USACE Pittsburgh District Streams	
Sleepy Creek	Morgan County
Cacapon River	Morgan County
Back Creek	Morgan County
Hackers Creek of West Fork River	Lewis County
All Wetlands	Berkeley County

Also, the following streams are known to have mussel populations which are established as a protected "no take" species by the State of West Virginia. Clients wishing to conduct projects or activities in these streams must contact the West Virginia Division of Natural Resources, Wildlife Resources Section, Wildlife Diversity Program with detailed project description and accurate project location description. *NOTE: WVDNR stream right-of-entry and/or CWA permits may also be required for some activities.*

USACE Huntington District Streams	
Elk River	**Middle Island Creek Drainage**
Big Sandy Creek	Middle Island Creek
New River	Meathouse Fork
Bluestone River	Buckeye Creek
Greenbrier River	**Mud River Drainage**
Little Kanawha River Drainage	Mud River
Little Kanawha River	Middle Fork
Steer Creek	**Ohio Direct Drainage**
Cedar Creek	Twelvepole Creek
Leading Creek	Beech Fork
Reedy Creek	Tug Fork River (upstream of Kermit, WV)
Spring Creek	Mill Creek (Jackson County)
Spruce Creek	**Kanawha River Drainage**
Henry's Fork	Indian Creek
Goose Creek	Hurricane Creek
James River Drainage	Pocatalico River
South Fork of Potts Creek	Kanawha River upstream from Charleston
	Coal River
USACE Pittsburgh District Streams	
Potomac River Drainage	**Monongahela River Drainage**
Cacapon River	Dunkard Creek
North River of Cacapon River	West Fork River
Patterson Creek	Hackers Creek of the Tygart Valley River (Barbour
Ohio Direct Drainage	Kincheloe Creek
Wheeling Creek	
Fishing Creek	

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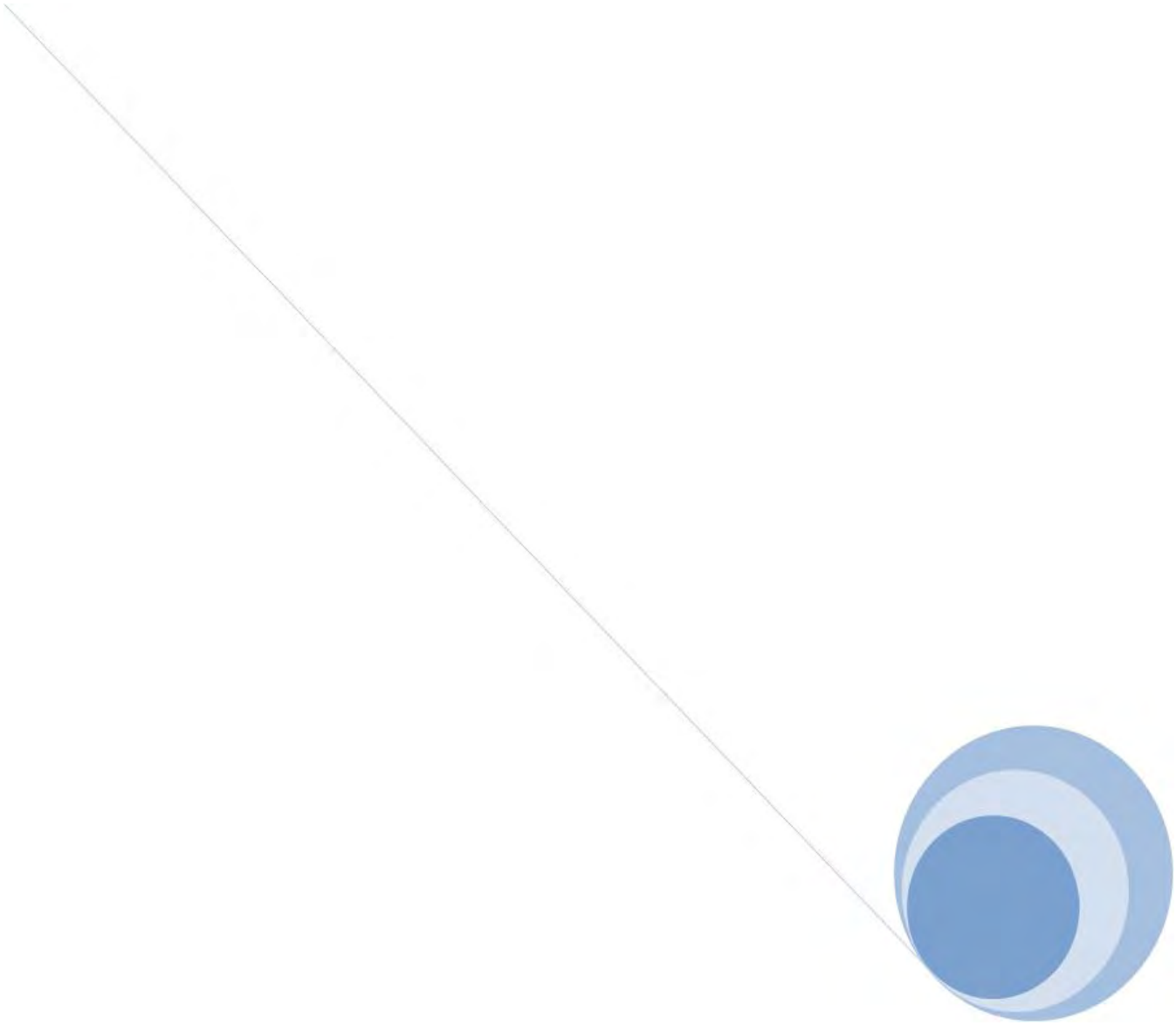

WV ENDANGERED SPECIES LIST

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	STATE DISTRIBUTION AND/OR CRITICAL HABITAT
Bald Eagle & Golden Eagle	*Haliaeetus leucocephalus* *Aguila chrysaetos*	---	These species are protected under the Bald and Gold Eagle Protection and Migratory Bird Treaty Acts. *
Cheat Mountain Salamander	*Plethodon nettingi*	Threatened	The Cheat Mountain salamander is one of 30 species of salamanders known to occur in West Virginia. It was discovered on White Top Mountain, Randolph County in 1935. There are over 70 known sites for this species. Grant, Pendleton, Pocahontas, Randolph, and Tucker counties.
Clubshell Mussel	*Pleurobema clava*	Endangered	Elk River - Braxton, Clay, and Kanawha counties; Hackers Creek - Lewis County; Meathouse Fork - Doddridge County; South Fork Hughes River - Ritchie County; Middle Island Creek – Known in Doddridge and Pleasants counties and may potentially also occur in Tyler County.
Diamond darter	*Crystallaria cincotta*	Candidate	Elk River – Clay and Kanawha counties.
Eastern Cougar	*Puma concolor couguar*	Endangered	This species is thought to be extinct or extirpated and there have been no documented, verified occurrences in WV in over 100 years. – Not identified in the ICT
Fanshell Mussel	*Cyprogenia stegaria*	Endangered	Kanawha River - Fayette and Kanawha counties; Ohio River – Known in Wood County and may potentially also occur in Cabell, Jackson, Mason, Pleasants, and Wayne counties.
Flat-spired Three-toothed Land Snail	*Triodopsis platysayoides*	Threatened	Monongalia and Preston counties, including both sides of Cheat River Gorge.
Harparella	*Ptilimnium nodosum*	Endangered	Berkeley and Morgan counties.
Indiana Bat	*Myotis sodalis*	Endangered	May occur throughout the state. Known hibernacula (winter habitat) in Fayette, Greenbrier, Mercer, Monroe, Pendleton, Pocahontas, Preston, Randolph, and Tucker counties. The Indiana bat may use abandoned mine portals (confirmed in the New River Gorge National River, Fayette County) or occupy summer habitat throughout the entire state. Maternity activity confirmed in Boone, Fayette, Ohio, Tucker, and Wetzel counties. Critical habitat: Hellhole Cave, Pendleton County. Two Conservation Areas are located in Boone County.
James Spiny Mussel	*Pleurobema collina*	Endangered	South Fork of Potts Creek and Potts Creek – Monroe County
Madison Cave Isopod	*Antrolana lira*	Threatened	Known in Jefferson County and may potentially also occur in Berkeley County.

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	STATE DISTRIBUTION AND/OR CRITICAL HABITAT
Mussel, snuffbox	*Epioblasma triquetra*	Proposed Endangered	Braxton County – Elk River and Little Kanawha River; Cabell County – Ohio River; Calhoun County – Steer Creek and West Fork Little Kanawha River; Doddridge County – Arnold Creek, Buckeye Creek, McElroy Creek, Meathouse Fork, Middle Island Creek, South Fork Hughes River, Toms Fork; Fayette County – Kanawha River; Gilmer County – Cedar Creek, Fink Creek, Leading Creek; Harrison – West Fork River; Kanawha County – Big Sandy Creek; Marshall County – Fish Creek; Monongalia County – Dunkard Creek; Pleasants County – McKim Creek and Sugar Creek; Ritchie County – Bonds Creek, Hughes River, North Fork Hughes River, Spruce Creek; Roane County – Henry's Fork, Reedy Creek, Spring Creek; Tyler County – Indian Creek, Point Pleasant Creek; Wetzel County – Fishing Creek; Wirt County – Goose Creek
Northeastern Bulrush	*Scirpus ancistrochaetus*	Endangered	Known in Berkeley and Hardy counties and may potentially also occur in Hampshire, Mineral, Morgan, and Pendleton counties.
Northern Riffleshell Mussel	*Epioblasma torulosa rangiana*	Endangered	Elk River - Kanawha County.
Pink Mucket Pearly Mussel	*Lampsilis abrupta*	Endangered	Kanawha River - Fayette County; Ohio River - Cabell, Mason and Wood counties and may potentially also occur in Jackson, Pleasants, and Wayne counties; Elk River - Clay and Kanawha counties.
Rayed Bean	*Villosa fabalis*	Proposed Endangered	Elk River – Kanawha and Clay counties.
Running Buffalo Clover	*Trifolium stoloniferum*	Endangered	Known in Barbour, Brooke, Fayette, Pocahontas, Randolph, Webster, and Tucker counties. May potentially also occur in Monongalia and Preston counties.
Shale-barren Rockcress	*Arabis serotina*	Endangered	Greenbrier, Hardy, and Pendleton counties.
Sheepnose	*Plethobasus cyphyus*	Candidate	Ohio River – Known in Pleasants County and may potentially also occur in Cabell, Jackson, Mason, Wayne, and Wood counties. Kanawha River – Fayette and Kanawha counties.
Small Whorled Pogonia	*Isotria medeoloides*	Threatened	Greenbrier County.
Spectacle Case	*Cumberlandia monodonta*	Candidate	Kanawha River – Known in Kanawha County and may potentially also occur in Fayette County.
Spiraea, Virginia	*Spiraea virginiana*	Threatened	Known in Fayette, Greenbrier, Mercer, Nicholas, Raleigh, and Summers counties. May also potentially occur in Upshur County.

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	STATE DISTRIBUTION AND/OR CRITICAL HABITAT
Squirrel, West Virginia northern flying	*Glaucomys sabrinus fuscus*	Endangered	Known to occur in high elevation spruce/hardwood forests in Grant, Greenbrier, Pendleton, Pocahontas, Randolph, Tucker, and Webster counties.
Tuberculed-blossom Pearly Mussel	*Epioblasma torulosa torulosa*	Endangered	Kanawha River - Fayette County. May be extinct.
Virginia Big-eared Bat	*Corynorhinus townsendii virginianus*	Endangered	Known summer or winter caves located in Grant, Pendleton, Randolph, Tucker and counties. Also known to utilize abandoned mine portals in the New River Gorge National River in Fayette County. May also occur in mine portals and caves throughout the state, particularly in Hardy, Kanawha, Mercer, Monroe, Nicholas, Preston, Raleigh, Summers, and Wyoming counties. Critical habitat: Hellhole Cave, Cave Mountain Cave, Hoffman School Cave, and Sinnitt/Thorn Mountain Cave, Pendleton County; Cave Hollow/Arbogast Cave, Tucker County.

List updated 11/11/11

**Refer to the ICT or the National Bald Eagle Management Guidelines for more information concerning the avoidance of impacts to eagles; or go to* http://www.fws.gov/northeast/EcologicalServices/eagle/guidelines/

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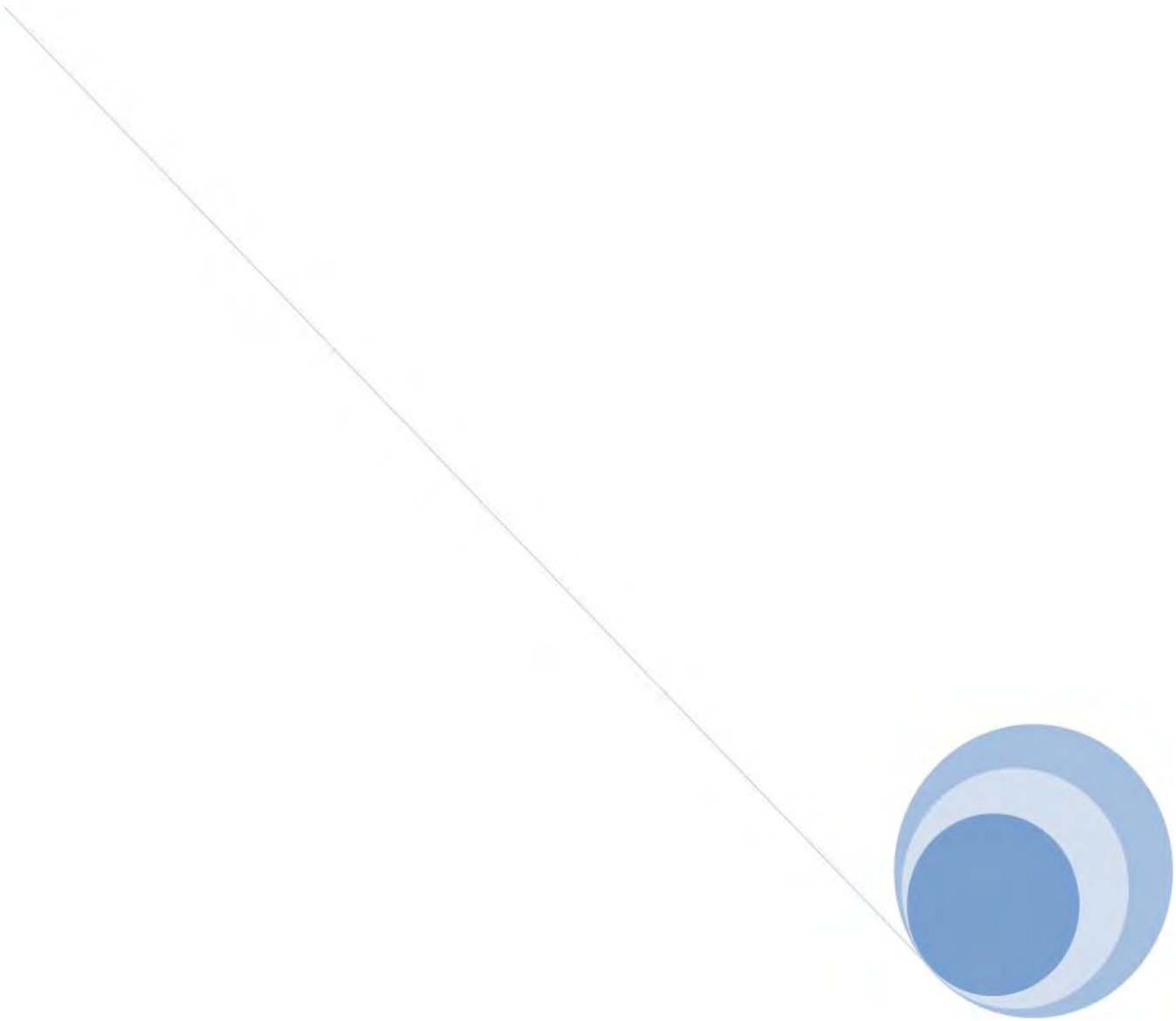

SPECIES FACT SHEETS

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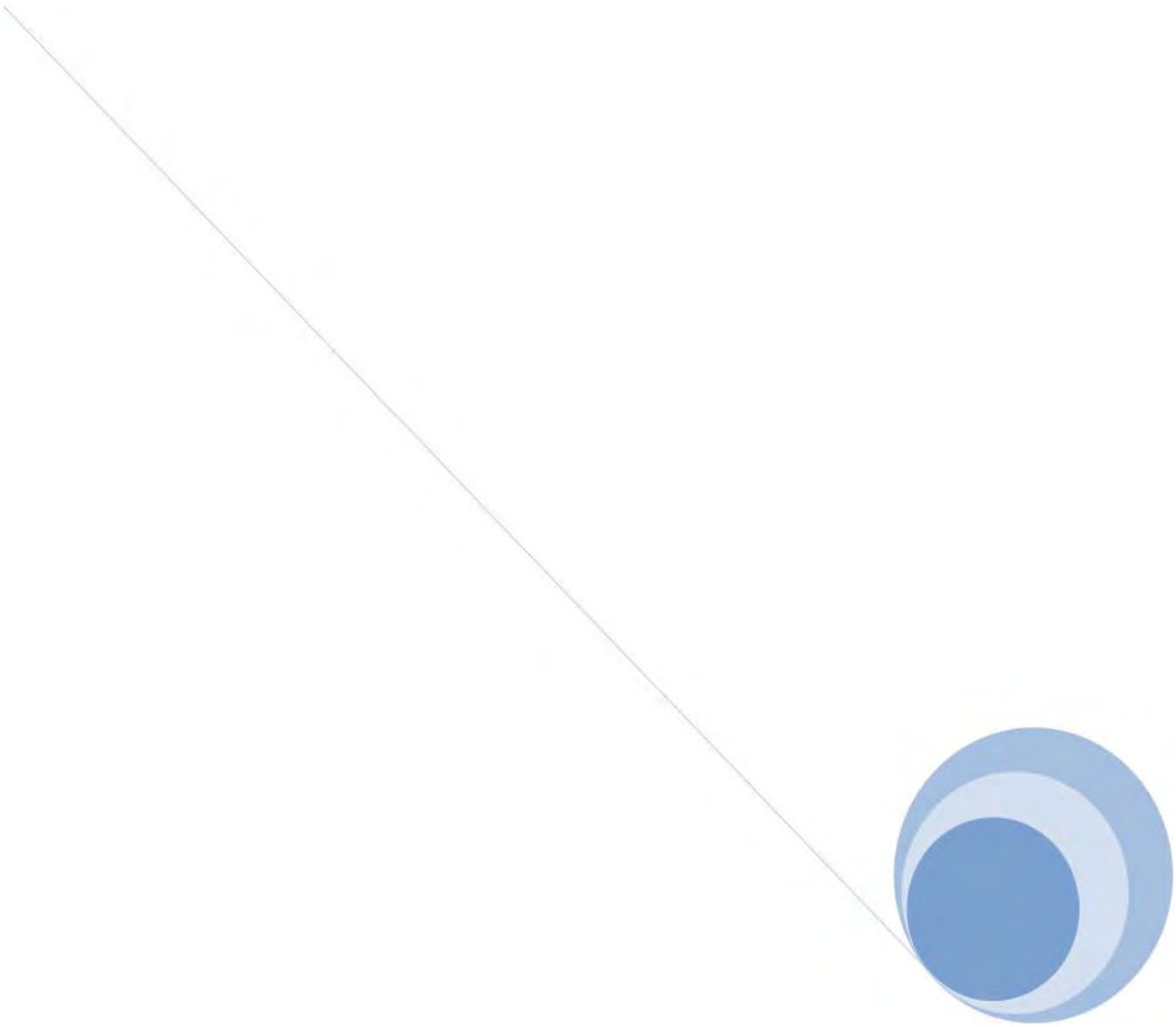

Harperella *(Ptilimnium nodosum)*

Common Name
Harperella

Scientific Name
Ptilimnium nodosum

Status
Harperella is listed by the United States Fish and Wildlife Service as federally Endangered but does not occur on any federal land, so the ability to protect the plant from destruction is limited.

West Virginia Status
Harperella is known to grow along three streams in West Virginia. An additional site was located, but this may be an extension of a previously known site. Harperella is known from less than 20 other sites (all in the U.S.).

Description
Harperella is an annual plant with a slender, smooth stem and hollow, quill-like leaves. Its flowers are similar in appearance to those of the common road-side plant, Queen Anne's lace. They are small, white, and delicate and are arranged in clusters called umbels. This plant flowers in May and June. Both harperella and Queen Anne's lace are members of the carrot family, where our cultivated carrot comes from.

Habitat
Harperella grows in wet soil near a body of water and can survive periodic, moderate flooding. In West Virginia harperella grows in rocky or gravelly beds along three clear, swiftly-flowing streams, namely, Sleepy Creek and the Cacapon and Potomac rivers in Morgan County. When these plants are knocked over or uprooted by high water, they can grow new roots from nodes in their stems. Outside of the state harperella also grows in shallow, intermittently-flooded coastal plain ponds. In addition to West Virginia, it is known from Alabama, Georgia, North Carolina, South Carolina and Maryland. Two types of harperella are currently recognized. It is believed that they are slightly different because of the growing conditions where they occur. The stream-side type, which used to be considered a different species, is generally shorter (20 to 45 cm high), has fewer flowers, and blooms later in the year (July to October) than the pond-side type which is 35 to 95 cm high and has flowers from May to June.


(WVDNR Photo)

Periodic flooding of streams where harperella grows in West Virginia usually keeps large amounts of soil from building up around the roots. harperella can thrive in small amounts of soil and in shallow water, but this flooding prevents most other plants from growing in the same places and competing with Harperella for resources. Thus, lack of flooding or even reduction in flooding could decrease harperella's chance for survival. Larger floods or longer periods of flooding, however, may be harmful even to the water-tolerant Harperella. The floods may wash away seeds from the soil, too much of the soil, and even the plants themselves. Flooding of the coastal plain ponds or upstream construction and mining activities near the stream sites may cause too much silt to gather around the roots of the plants and choke them. Because Harperella is so dependent on streams or ponds for its survival, it is directly affected by changes in water quality and by many forms of water pollution.

Threats and Prospects
Harperella in not commercially collected nor under severe threat of collection for recreational, scientific, or educational purposes. No known diseases threaten the species, but some grazing of it by animals occurs along pond populations. Human activities, such as construction and alterations in water quality of streams and ponds, have already destroyed about half of the known populations of harperella. An

Alabama population has been eliminated by excessive siltation; many coastal plain ponds in South Carolina have been drained or severely disturbed. In West Virginia, 10,000 plants were destroyed in 1984 by construction at a housing subdivision. More recently plants have been lost apparently due to situation from highway construction. Because harperella does not occur on federal land, it receives no direct protection from federal management. Except in Maryland, it is not protected by state law from habitat loss. However, some populations in states other than West Virginia occur on state-owned or state-controlled land or on private preserves. Many states and private groups are working towards protecting these areas to the best of their ability.

Madison Cave Isopod *(Antrolana lira)*

Common Name
Madison Cave Isopod

Scientific Name
Antrolana lira

Status
The Madison cave isopod is listed by the U.S. Fish and Wildlife Service as federally Threatened in 1982. At that time it was known only from the Shenandoah Valley of Virginia.

West Virginia Status
The Madison Cave isopod is known from two sites in Jefferson County. One site is a cave that intersects the ground water, and the second is a well. This animal probably occurs in pockets of ground water that extend beyond the sites where it has been observed. All other occurrences are in Virginia.

Description
The Madison Cave isopod is rather large for an isopod (the common terrestrial "pill bug" or "sow bug" is a good example of the general form of an isopod) reaching a maximum length of 18 mm (0.7 inch). Females are slightly larger than males. Its body is dorsal-ventrally (top to bottom) flattened. It has two pairs of antennae, the first pair is short and the second is long. Like many cave-adapted species, the Madison Cave isopod is blind and un-pigmented. Movement is by walking on the substrate or by swimming.

Habitat
The Madison Cave isopod inhabits underground lakes and deep karst aquifers where it lives in the groundwater. It has been observed in a few caves that descend to the groundwater table.

Threats And Prospects
Contamination of groundwater is the major threat to the Madison Cave isopod. Sources of contaminants include agricultural runoff, poultry farms, and runoff from developments.

Range
This species is restricted to the Shenandoah Valley of Virginia and West Virginia.

Life History
Little is known about the life history of this species. Biologists suspect that this species is long-lived and has a low rate of reproduction.


(Photo by Craig Stihler)

Diet
This species probably feeds on detritus that finds its way into the groundwater.

Additional Comments
This species was discovered in 1958 in Madison Saltpetre Cave in Augusta County, Virginia. The Madison Cave isopod belongs to a group (family *Cirolanidae)* that consists largely of marine species. This is the only freshwater species found north of Texas.

Help
Cavers visiting caves in the Shenandoah Valley are encouraged to report sightings of "large" (nearly 0.6 in+) white aquatic isopods. Residents of the Shenandoah Valley should work to protect groundwater quality.

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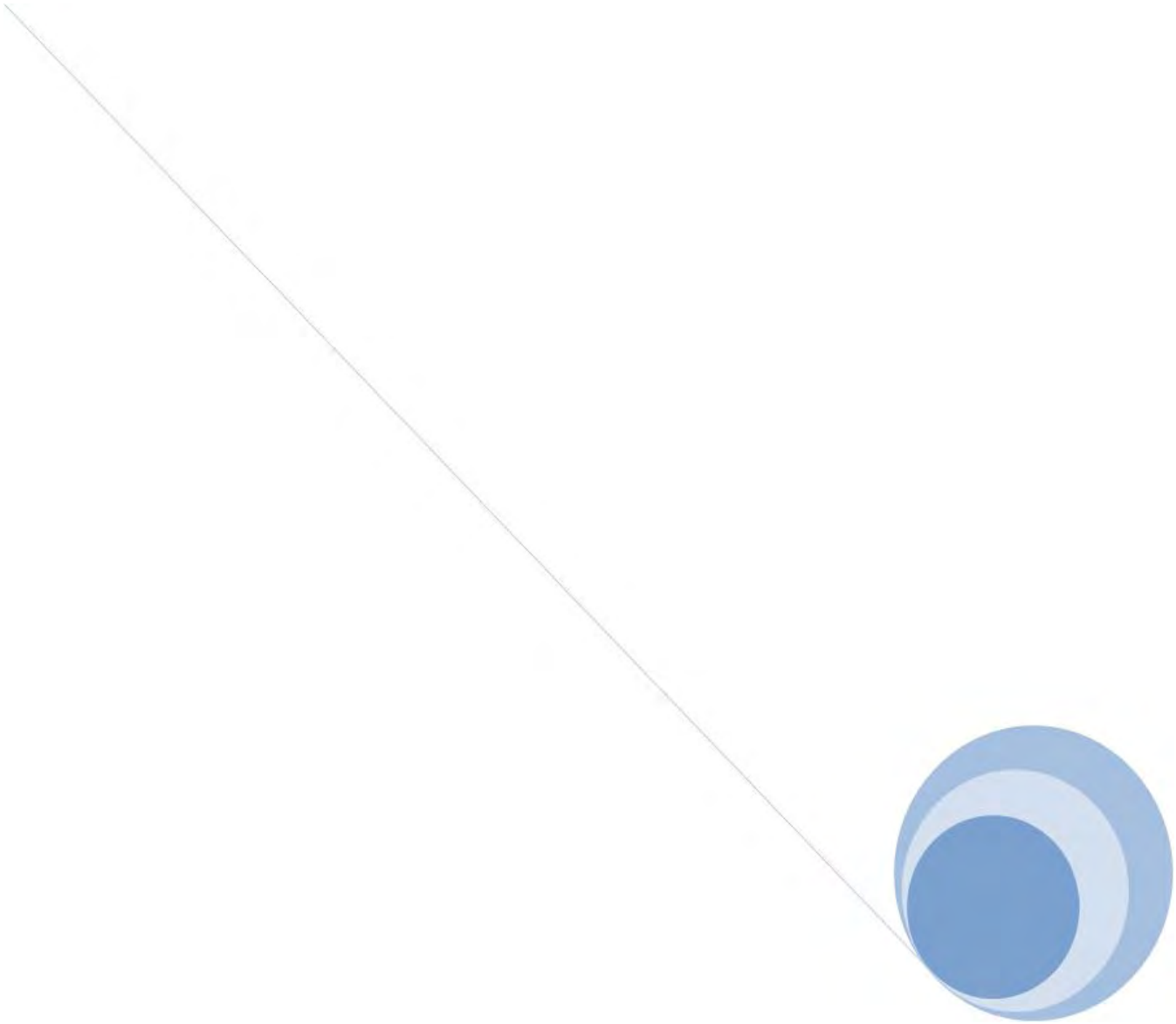

Cheat Mountain Salamander *(Plethodon netting)*

Common Name
Cheat Mountain Salamander

Scientific Name
Plethodon nettingi

Status
The Cheat Mountain salamander has been listed by the U.S. Fish and Wildlife Service as Threatened throughout its range since 1989.


(Photo by Craig Stihler)

West Virginia Status
The Cheat Mountain salamander is one of 30 species of salamanders known to occur in West Virginia. It was discovered by Graham Netting and Leonard Llewelly on White Top Mountain, Randolph County in 1935 and was described (named) by N. Bayard Green in 1938. There are over 70 known sites for this species in the mountainous areas of Tucker, Grant, Randolph, Pendleton, and Pocahontas counties.

Description
The Cheat Mountain salamander belongs to a group known as the woodland salamanders (Plethodontids). There are generally two sizes of woodland salamanders, large and small. Large species include the slimy salamander and Wehrle's salamander. The Cheat Mountain salamander is one of the small woodland species attaining a length of 10 centimeters (4 inches) from the tip of the snout to the tip of the tail. It is black or dark brown with brassy or silvery flecks above and uniformly dark gray beneath. The tail of this species is about the same length as its body, and the body has 17 to 19 costal grooves (vertical grooves along its sides).

Habitat
Originally, the Cheat Mountain salamander was probably restricted to the red spruce forests of West Virginia's higher mountains. Since most of these forests were cut by 1920, several populations today occur in mixed deciduous forests that have replaced red spruce stands; these forests include yellow birch, American beech, sugar maple, striped maple, and Eastern hemlock trees. Typically, this species is found in cool, moist red spruce forests with a ground cover comprised of a liverwort called Bazzania and an abundance of leaf litter, fallen logs, and sticks

Threats and Prospects
The main threat to the Cheat Mountain salamander is degradation of high-elevation red spruce and spruce/northern hardwood forests. Any disturbance exposing the forest floor to sunlight changes the cool, moist conditions on which these animals depend for nest sites as well as food and oxygen procurement. Alterations as minor as clearing service roads or hiking trails can fragment and isolate populations as these salamanders do not cross bare surfaces. As populations become divided their gene pools decline and so do their chances of remaining viable. Scientists have speculated that habitat alterations may favor the encroachment of mountain dusky and redback salamanders which subsequently out-compete the Cheat Mountain salamander for food, cover, and moist spots. The Cheat Mountain salamander has been protected under the Federal Endangered Species Act since 1989. Furthermore, much of its range falls within the Mononaghela National Forest which seeks to protect the habitat of this and other rare animals. Annual surveys by Marshall University's Dr. Thomas Pauley, a renowned expert on this species, indicate that its numbers appear to be stable except where habitats have been altered. With continued discretion in the management of high-elevation spruce and associated hardwood forests, the future of the Cheat Mountain salamander looks sound.

Range
Some woodland salamanders have very large ranges. For example, the redback salamander extends throughout most of the northeastern United States including West Virginia. The Cheat Mountain salamander, however, is endemic to West Virginia (it occurs in the Mountain State and nowhere else). It is the only described vertebrate species in the state that is found entirely within WV. The entire range of this species is 2400 square kilometers (935 square miles), the approximate area of Kanawha county. Within this area there exist many disjunct populations, i.e. they are not in contact with each other. This salamander occurs in the high mountains of East Central West Virginia from Backbone Mountain, Tucker County in the north to Thorny Flat, Pocahontas County in the south. It is generally found above 1130 meters (3,500 feet), however in the northern part of its range it extends down to 852 meters (2,640 ft).

Life History
Cheat Mountain salamanders spend the winter underground where temperatures remain above freezing. When the weather warms up, usually around May, these salamanders emerge from underground. The female typically lays 8 to 10 eggs which are attached to the inside of a rotten log or the underside of a rock or log. The female guards the eggs until they hatch, a behavior unique to salamanders of the family Plethodontidae. The young undergo their larval stage within the egg so that they resemble small adults when they hatch in late August or September. The juveniles reach sexual maturity in 3-4 years and live for approximately 20 years. The young may remain in the same area as the adults until they become mature at which time they move away and establish territories. Territories are about five square meters (48 square feet) in area. Woodland salamanders seldom leave their territories and, as a result, move only a few meters during their lives. Like all amphibians, salamanders lack an external covering of scales, hair, or feathers. Instead their skin is slimy and must stay moist. Lungless salamanders, such as the Cheat Mountain salamander, breathe through their skin and the lining of their mouths and therefore require a habitat that is moist and cool.

Diet
Like all woodland salamanders, the Cheat Mountain salamander preys on small insects and other invertebrates including mites, springtails, beetles, flies and ants. On moist evenings it searches the forest floor, rocks, and logs for food. It will occasionally climb trees, shrubs, and stumps in pursuit of food.

Clubshell *(Pleurobema clava)*

Common Name
Clubshell

Scientific Name
Pleurobema clava

West Virginia Status
Hackers Creek (Lewis, Harrison Counties); Meathouse Fork of Middle Island Creek (Doddridge County), Elk River (Clay, Braxton, Kanawha Counties), Little Kanawha River (Calhoun County), South Fork Hughes River (Ritchie County). This freshwater mussel is listed by the U.S. Fish and Wildlife Service as federally Endangered.

Description
Wedge-shaped shell resembling the head of a golf club, up to 7.6 cm (3 in) long; straw yellow to brown with green rays, white nacre

Habitat
Freshwater mussels live in a variety of substrates including sand, gravel, cobble and mixed materials on the bottoms of streams and rivers. They generally require free-flowing, clean, well-oxygenated water. The Clubshell lives in a variety of environments ranging from large rivers to shallow streams.

Threats and Prospects
Because they are sedentary filter feeders, mussels are extremely susceptible to changes in water quality. The creation of dams, levies, channels and the practice of dredging has degraded the habitats of many species in West Virginia. These practices often increase siltation which may smother mussels, choke out their food sources, or harm their host fish. Also, because they are long-lived, mussels are vulnerable to toxins which they can accumulate over a number of years. Land use practices--forestry, mining and agriculture--may also negatively impact mussel populations through erosion, pollution, acid runoff, trampling by livestock and altering water temperatures. Mussels are extremely vulnerable because of their dependence on fish as larval hosts. Any alteration that affects their host fish, whether detrimental to adult mussels or not, can interfere with their reproductive cycles, and cause population declines. The button industry that once thrived in St. Marys exacted a heavy toll on the thicker-shelled mussels. Mussels are still collected in some states for their role in culturing pearls. Possession of mussels is now illegal in West Virginia, and a permit is required to collect for scientific purposes. The latest scourge to freshwater mussels is a biological one: zebra mussels. These small, non-native bivalves are not dependent on fish hosts, and as a result, can spread extremely quickly. They kill native mussels by encrusting them and intercepting their food and oxygen.

Range
Ohio River basin from Illinois down to Alabama over to Virginia and up across West Virginia, Pennsylvania to Michigan.


(Photo by Craig Stihler)

Life History
Mussels have a complex life history that involves egg, larva, juvenile and adult forms. Reproduction for most species begins in the spring when males release sperm into the water column. Females take up sperm through their siphons. Eggs are fertilized and develop into tiny larvae known as glochidia within the mother's gills. Because of this nurturing role, the shells of the females in some species have a posterior (rear) bulge. Some species of mussels finish incubating their young by the summer while others incubate throughout the fall and winter. Most Unionid mussels depend on one or several fish species to serve as hosts and disperse their developing larvae. Glochidia latch onto the gills or fins of fish from which they derive nutrients before

detaching and falling to their new locations. The juveniles, which have taken on a bivalve (adult) form by the time they depart their hosts, spend their first year or two buried in the stream floor where they feed with a fleshy (byssal) foot. Adults embed themselves in the substrate of the stream where they siphon food items from the passing water. Adult mussels are sessile, seldom moving more than a few meters in their lifetimes. A fleshy foot allows them to adjust their positions within the substrate. In good water conditions, mussels can live from 15 to over 50 years. Some individuals have been known to exceed 100 years of age.

Diet

Freshwater mussels eat a variety of microscopic organisms including algae, diatoms, phytoplankton, zooplankton and detritus which they filter out of the water.

Help

Refrain from collecting native mussels and report those who do to: Division of Natural Resources, P.O. Box 67, Elkins, WV 26241, (304) 637-0245 or your local conservation officer. Also, be aware of any unauthorized stream modification activities in your area and report suspected toxic spills or illegal dumping of wastes to your local Division of Environmental Protection office. Please discard any unused live bait on land or return it to where it was collected. Thoroughly cleanse buckets and boats when going between streams; pests like the zebra mussel can be inadvertently spread by boats and in bait buckets. If you have cattle, keep them from wallowing in streams where they may crush fragile mussels, or restrict their access to a small area in the stream. Promoting streamside vegetation to reduce erosion and shade streams also benefits freshwater mussels.

Flat-Spired Three-Toothed Land Snail *(Triodopsis platysayoides)*

Common Name
Flat-Spired Three-Toothed Land Snail

Scientific Name
Triodopsis platysayoides

Status
The U.S. Fish and Wildlife Service list this species as Threatened.

West Virginia Status
This snail is known from a very restricted area of the Cheat River Gorge in Monongalia and Preston counties. There are 73 known localities for the species. Many of these sites are located in an area only 3.4 km X 5.4 km (2.4 mi X 3.8 mi) in size. Little information is available on the population trends of this animal, but populations appear to be stable at this time.

Description
The shells of adult flat-spired three-toothed land snails range from 19.4 mm to 25.1 mm (a little less than 1 inch) in diameter. The spire, or the dorsal surface of the shell, is quite flat and not conical (cone-shaped) as in most snails. The shell is brown in color, and the body of the animal is dark gray. The "three-toothed" portion of this animal's name is rather misleading; this snail has only one "tooth" located inside the aperture (opening) of the shell (other closely related species do have three "teeth"). This tooth is actually a thickening in the wall of the shell that is thought to help the snail defend itself against predators, such as snail-eating beetles, that try to enter the snail's shell to attack the animal. When these snails mature, a white lip is formed around the edge of the aperture, and the snail's shell stops growing.

Habitat
This snail is usually associated with outcroppings of sandstone known as the Upper Connoquenessing Sandstone. Areas where this snail occurs are usually wooded and dominated by sandstone cliffs or areas of large sandstone boulders. The snails are often found in cracks and crevices in the rocks or in small cave-like structures. At one site, the snail is associated with a cave in the limestone layer beneath the sandstone.

Threats and Prospects
Because this snail has a very restricted range, local catastrophes, such as forest fires, could impact a large segment of the population. At the site with the highest density of these snails, recreational activities have caused some problems; in addition to the direct crushing of some snails, the foot traffic can destroy the leaf litter in which the snails live. Fences have been constructed at one site as a means to reroute foot traffic away from the areas where the snail occurs. Another potential threat is the possible development of the rim of Cheat River Gorge for housing developments and recreational facilities. Any activities, such as forest fires or timbering, that alter the environmental conditions (temperature, humidity, moisture content of the soil, etc.), could be detrimental to populations of this rare snail.


(Photo by Craig Stihler)

Range
This snail is known only from West Virginia. See "West Virginia Status."

Life History
Little is known of the life history of this animal, but some information has been obtained from a captive colony. Small clusters of eggs are laid in the spring and summer. The eggs are usually buried in the soil or leaf litter. The young snails grow quite rapidly, and those that hatch early in the season can mature (produce a lip around the aperture of the shell) during their first summer; the other snails mature the following year.

Diet
The diet of this snail is not known, but it probably feeds on various types of vegetative matter.

Additional Comments
This snail was first described in 1933 based on a specimen collected at Coopers Rock.

James Spiny Mussel *(Pleurobema collina)*

Common Name
James spiny mussel

Scientific Name
Pleurobema collina

West Virginia Status
Found in Potts Creek watershed (Monroe County); only endangered Atlantic slope mussel in WV. This freshwater mussel is listed by the U.S. Fish and Wildlife Service as federally Endangered.

Description
5.1 cm (2 in) oblong shell; 3 short spines on each valve, usually only seen on young specimens

Habitat
Freshwater mussels live in a variety of substrates including sand, gravel, cobble and mixed materials on the bottoms of streams and rivers. They generally require free-flowing, clean, well-oxygenated water. The James Spiny mussel lives in a variety of environments ranging from large rivers to shallow streams.

Threats and Prospects
Because they are sedentary filter feeders, mussels are extremely susceptible to changes in water quality. The creation of dams, levies, channels and the practice of dredging has degraded the habitats of many species in West Virginia. These practices often increase siltation which may smother mussels, choke out their food sources, or harm their host fish. Also, because they are long-lived, mussels are vulnerable to toxins which they can accumulate over a number of years. Land use practices--forestry, mining and agriculture--may also negatively impact mussel populations through erosion, pollution, acid runoff, trampling by livestock and altering water temperatures. Mussels are extremely vulnerable because of their dependence on fish as larval hosts. Any alteration that affects their host fish, whether detrimental to adult mussels or not, can interfere with their reproductive cycles, and cause population declines. The button industry that once thrived in St. Marys exacted a heavy toll on the thicker-shelled mussels. Mussels are still collected in some states for their role in culturing pearls. Possession of mussels is now illegal in West Virginia, and a permit is required to collect for scientific purposes. The latest scourge to freshwater mussels is a biological one: zebra mussels. These small, non-native bivalves are not dependent on fish hosts, and as a result, can spread extremely quickly. They kill native mussels by encrusting them and intercepting their food and oxygen.

Life History
Mussels have a complex life history that involves egg, larva, juvenile and adult forms. Reproduction for most species begins in the spring when males release sperm into the water column. Females take up sperm through their siphons. Eggs are fertilized and develop into tiny larvae known as glochidia within the mother's gills. Because of this nurturing role, the shells of the females in some species have a posterior (rear) bulge. Some species of mussels finish incubating their young by the summer while others incubate throughout the fall and winter.


(USFWS Photo)

Most Unionid mussels depend on one or several fish species to serve as hosts and disperse their developing larvae. Glochidia latch onto the gills or fins of fish from which they derive nutrients before detaching and falling to their new locations. The juveniles, which have taken on a bivalve (adult) form by the time they depart their hosts, spend their first year or two buried in the stream floor where they feed with a fleshy (byssal) foot. Adults embed

themselves in the substrate of the stream where they siphon food items from the passing water. Adult mussels are sessile, seldom moving more than a few meters in their lifetimes. A fleshy foot allows them to adjust their positions within the substrate. In good water conditions, mussels can live from 15 to over 50 years. Some individuals have been known to exceed 100 years of age.

Range
Upper James River basin, Virginia and West Virginia.

Diet
Freshwater mussels eat a variety of microscopic organisms including algae, diatoms, phytoplankton, zooplankton and detritus which they filter out of the water.

Help
Refrain from collecting native mussels and report those who do to: Division of Natural Resources, P.O. Box 67, Elkins, WV 26241, (304) 637-0245 or your local conservation officer. Also, be aware of any unauthorized stream modification activities in your area and report suspected toxic spills or illegal dumping of wastes to your local Division of Environmental Protection office. Please discard any unused live bait on land or return it to where it was collected. Thoroughly cleanse buckets and boats when going between streams; pests like the zebra mussel can be inadvertently spread by boats and in bait buckets. If you have cattle, keep them from wallowing in streams where they may crush fragile mussels, or restrict their access to a small area in the stream. Promoting streamside vegetation to reduce erosion and shade streams also benefits freshwater mussels.

Northeastern Bulrush *(Scirpus ancistrochaetus)*

Common Name
Northeastern Bulrush

Scientific Name
Scirpus ancistrochaetus

Status
Northeastern bulrush is listed by the United States Fish and Wildlife Service as federally Endangered.


(WVDNR Photo)

West Virginia Status
This bulrush is known to grow at only in three sites in West Virginia, two of which are just one mile from each other. There are approximately thirty additional sites for this species in the U.S.

Description
Northeastern bulrush is a tall, slender, perennial plant with many long, narrow leaves. It grows 80 to 120 cm high, and sometimes has at its top drooping clusters of spikelets which contain very small flowers. Some of the plants, however, may not have these groups of flowers and will not produce seeds. These plants sometimes reproduce by growing new stems from their roots or from nodes in their stems when they are knocked over.

Habitat
Northeastern bulrush is a member of the sedge family and grows in or at the edge of ponds and other small expanses of standing water whose levels fluctuate through the year. It can survive these periodic changes in water level but will decline if the water level permanently drops because it needs to be in the water or beside water. In West Virginia the species grows in four small sinkhole ponds on two private property locations in Berkeley County, and in a sinkhole pond in Hardy County. As can be guessed from the name, Northeastern bulrush occurs only in the Northeast of the United States. It is located in small, hilly areas of New Hampshire, Vermont, Massachusetts, Pennsylvania, West Virginia, and Virginia. The bulrush has been found previously in New York, but the population of plants is no longer there.

Factors
Because Northeastern bulrush grows directly in ponds, sinkholes, and other wetlands or at their edges, it is directly affected by changes in water quality and by many forms of water pollution. Deer sometimes eat and trample the plants where they grow in shallow water and at the edges of the wet areas. Off road vehicle damage to these areas during dry periods has increased in recent years. If too many other types of plants, especially trees, grow up close to the wet areas where the bulrush occurs, it will have less space in which to grow and possibly will have less sunlight, nutrients, and water. Conversely, having too few plant types around may leave the bulrush unprotected from other disturbances. Permanent flooding of the areas where Northeastern bulrush grows is sometimes caused by beaver dams or by the removal of many trees from around the wet area.

Threats and Prospects
Several of the locations where Northeastern bulrush grows are on state-owned or state-controlled land. These areas can be protected from damage to a larger extent than those owned by private citizens or groups. Populations of the bulrush on private land are threatened by agricultural or building projects which involve filling the ponds with soil or draining them. Efforts are currently underway to protect Northeastern bulrush wherever it occurs and to search likely habitat for new populations. The threats to each known population are being examined, and the cooperation and support of private landowners and public land managers is being sought.

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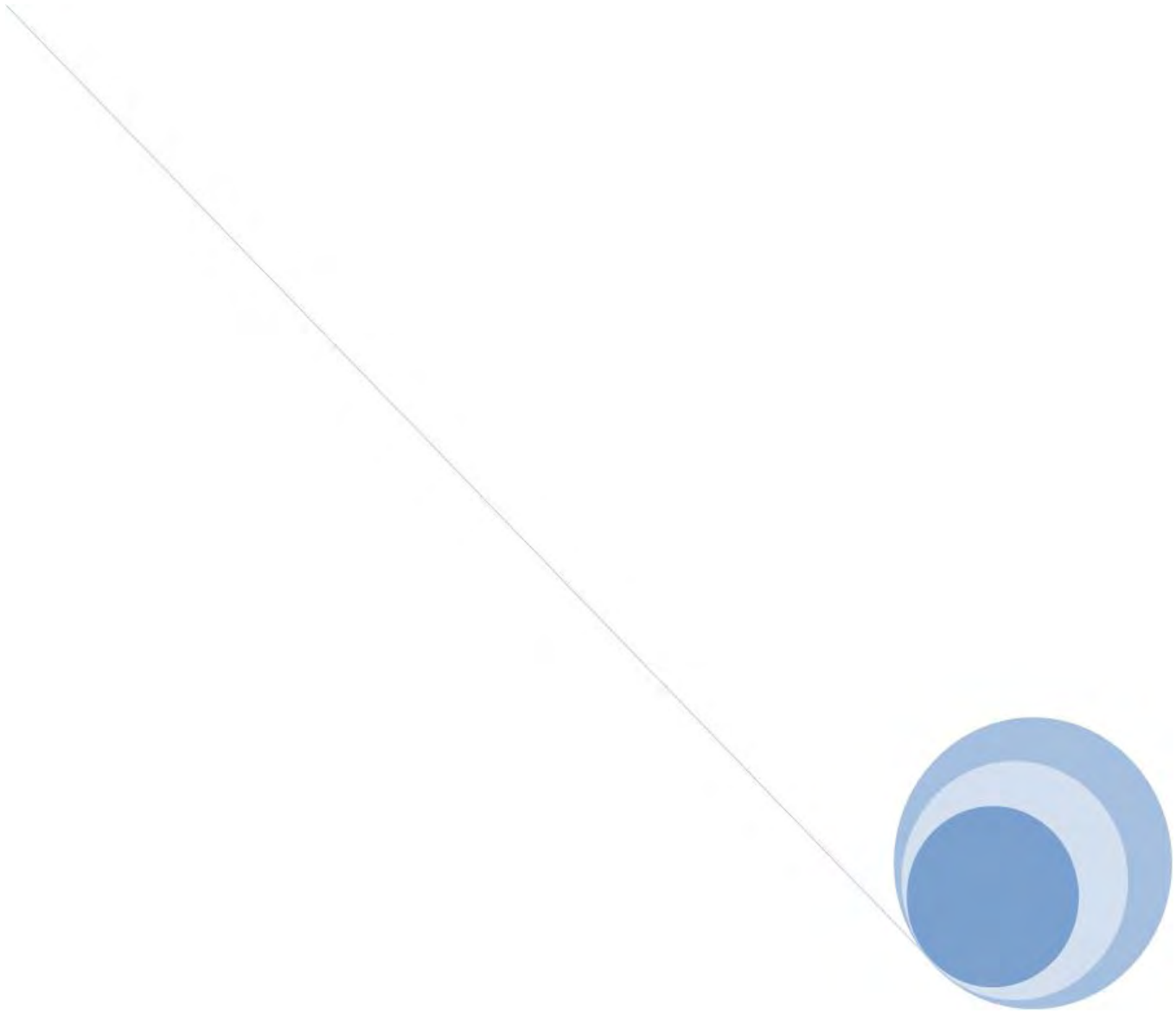


Northern Riffleshell *(Epioblasma torulosa rangiana)*

Common Name
Northern Riffleshell

Scientific Name
Epioblasma torulosa rangiana

West Virginia Status
Elk River (Kanawha County). Only two specimens ever reported in WV. This species is listed as Endangered by the U.S. Fish and Wildlife Service.

Description
5.1 cm (2 in) yellow-brown, oblong shell with green rays and ridge; female has expanded front edge

Habitat
Freshwater mussels live in a variety of substrates including sand, gravel, cobble and mixed materials on the bottoms of streams and rivers. They generally require free-flowing, clean, well-oxygenated water. The Northern riffleshell is found in swift flowing riffles and runs of smaller streams.

Threats and Prospects
Because they are sedentary filter feeders, mussels are extremely susceptible to changes in water quality. The creation of dams, levies, channels and the practice of dredging has degraded the habitats of many species in West Virginia. These practices often increase siltation which may smother mussels, choke out their food sources, or harm their host fish. Also, because they are long-lived, mussels are vulnerable to toxins which they can accumulate over a number of years. Land use practices--forestry, mining and agriculture--may also negatively impact mussel populations through erosion, pollution, acid runoff, trampling by livestock and altering water temperatures. Mussels are extremely vulnerable because of their dependence on fish as larval hosts. Any alteration that affects their host fish, whether detrimental to adult mussels or not, can interfere with their reproductive cycles, and cause population declines. The button industry that once thrived in St. Marys exacted a heavy toll on the thicker-shelled mussels. Mussels are still collected in some states for their role in culturing pearls. Possession of mussels is now illegal in West Virginia, and a permit is required to collect for scientific purposes. The latest scourge to freshwater mussels is a biological one: zebra mussels. These small, non-native bivalves are not dependent on fish hosts, and as a result, can spread extremely quickly. They kill native mussels by encrusting them and intercepting their food and oxygen.

Range
Ohio River and Great Lakes basins--Michigan and Ontario down into West Virginia and west to Illinois.


(Photo by Craig Stihler)

Life History
Mussels have a complex life history that involves egg, larva, juvenile and adult forms. Reproduction for most species begins in the spring when males release sperm into the water column. Females take up sperm through their siphons. Eggs are fertilized and develop into tiny larvae known as glochidia within the mother's gills. Because of this nurturing role, the shells of the females in some species have a posterior (rear) bulge. Some species of mussels finish incubating their young by the summer while others incubate throughout the fall and winter. Most Unionid mussels depend on one or several fish species to serve as hosts and disperse their developing larvae. Glochidia latch onto the gills or fins of fish from which they derive nutrients before detaching and falling to their new locations. The juveniles, which have taken on a bivalve (adult) form by the time they depart their hosts, spend their first year or two buried in the stream floor where they feed with a fleshy (byssal) foot. Adults embed themselves in the substrate of the stream where they

siphon food items from the passing water. Adult mussels are sessile, seldom moving more than a few meters in their lifetimes. A fleshy foot allows them to adjust their positions within the substrate. In good water conditions, mussels can live from 15 to over 50 years. Some individuals have been known to exceed 100 years of age.

Diet

Freshwater mussels eat a variety of microscopic organisms including algae, diatoms, phytoplankton, zooplankton and detritus which they filter out of the water.

One and one-half year-old northern riffleshell mussels reared at the White Sulphur Springs National Fish Hatchery in West Virginia.

Help

Refrain from collecting native mussels and report those who do to: Division of Natural Resources, P.O. Box 67, Elkins, WV 26241, (304) 637-0245 or your local conservation officer. Also, be aware of any unauthorized stream modification activities in your area and report suspected toxic spills or illegal dumping of wastes to your local Division of Environmental Protection office. Please discard any unused live bait on land or return it to where it was collected. Thoroughly cleanse buckets and boats when going between streams; pests like the zebra mussel can be inadvertently spread by boats and in bait buckets. If you have cattle, keep them from wallowing in streams where they may crush fragile mussels, or restrict their access to a small area in the stream. Promoting streamside vegetation to reduce erosion and shade streams also benefits freshwater mussels.

Virginia Big-Eared Bat *(Corynorhinus townsendii virginianus)*

Common Name
Virginia Big-Eared Bat

Scientific Name
Corynorhinus townsendii virginianus

Status
This bat, a subspecies of Townsend's big-eared bat, is listed as federally Endangered by the US Fish and Wildlife Service. The total population is probably less than 20,000 individuals.

West Virginia Status
More Virginia big-eared bats occur in West Virginia than in any other state. Caves are very important for this bat, and most of the significant caves are protected in some way. As a result, populations in the state are increasing. Populations in some caves have increased as much as 350% from 1983 to 1995.

Description
The Virginia big-eared bat is a moderate-sized bat weighing 9-12 grams (the common little brown myotis weighs around 6 grams). The fur is brown, and the underparts are buff-colored. The large ears are over 2.5 centimeters (1 inch) in length. There are two prominent lumps on the nose. The hairs on the toes do not extend much beyond the ends of the toes. The only bat it can be confused with is Rafinesque's big-eared bat, but this bat has white belly fur and long toe hairs.

Habitat
Caves are used by Virginia big-eared bats in both winter and summer. During the winter, these bats hibernate in caves that provide cold, but above freezing, temperatures. Most of the world's Virginia big-eared bats hibernate in just three caves. One cave in West Virginia harbors over 6350 hibernating Virginia big-eared bats, the largest concentration of these bats anywhere. Female Virginia big-eared bats form maternity colonies in caves where they rear their young. Warm caves are most suitable for maternity colonies, but a few maternity colonies occur in cold caves. In these caves, the colony gathers in small domes in the cave ceiling where their body heat is trapped, creating a pocket of warm air. Virginia big-eared bats forage in a variety of habitats including old fields, hay fields, and forested areas. Radio-telemetry studies in West Virginia have shown that these bats travel up to 10.5 kilometers (6.5 miles) from the cave roost to feed. Individual bats often return to the same feeding area night after night.

Threats and Prospects
The number of Virginia big-eared bats declined sharply from the 1950's to the early 1980's. Most of the decline has been attributed to human disturbance of these animals in their cave roosts. During winter, these bats are more sensitive than most bats to disturbance, and they are easily awakened from hibernation. Because the bats must survive the winter on a limited amount of stored fat, each arousal uses up some of the fat reserve the bats need to survive. If they are disturbed repeatedly throughout the winter, they starve to death before spring arrives. In the summer, disturbance of maternity colonies causes the females to panic. Young dropped to the cave floor may not be recovered, and the bats may abandon the site altogether. Although pesticides have affected other bat species, they do not seem to have played a significant role in the decline of this species. Fortunately, Virginia big-eared bat numbers have increased since the early 1980's. This is the result of the protection of cave roosts. Critical caves are closed to human travel during the time when the bats are using the cave. Gates and fences have been built at some cave entrances.


(Photo by Joe Miller)

Range
There are five recognized subspecies of Townsend's big-eared bat. Two of these subspecies occur in the

western United States, and one subspecies is found in Mexico. Another subspecies is found in the karst region (an area characterized by limestone and associated sinkholes and caves) of the Ozark Mountains. The fifth subspecies, the Virginia big-eared bat, occurs in the southern Appalachian Mountains. Populations exist in Kentucky, North Carolina, Virginia, and West Virginia.

Life History

Mating takes place in the fall and winter, but the sperm is stored and the ova is not fertilized until the next spring. Pregnant females start to appear in the maternity colony as early as mid-March, but most do not arrive until later. The number of bats in maternity colonies in West Virginia ranges from 120 to 1350 bats (based on 1995 data). The gestation period for this species varies from 56 to 100 days depending on the ambient (outside) temperature (the young develop quicker during warm springs). In West Virginia, most young are born in June. Each female has a single young, known as a "pup." The pups are quite large and may weigh as much as 25% of the mother's weight.

The young are capable of flight by the time they are three weeks old; by six weeks of age they are weaned. The location of most males during the summer is not known, but a few "bachelor" colonies have been found. Virginia big-eared bats do not leave their cave roost until quite late in the evening. For this reason, they are rarely seen as they forage.

During the night the bats punctuate feeding bouts with periods of inactivity when they digest their food.

During these periods of rest, the bats often roost near their foraging areas. They have been observed night-roosting in old sheds, in trees, under bridges, and even in an old chicken coop. These bats do travel long distances; the largest movement recorded is around 57 kilometers (40 miles).The oldest known Townsend's big-eared bat on record was 16 years 5 months in age. In the autumn, the bats put on fat to get them through the winter when the insects they fed on are not available. Some bats begin to return to the hibernation site in September, but they still continue to feed each warm evening. By December, the bats have entered hibernation. During hibernation the bats form dense clusters on the cave ceiling.

Diet

Like all bats in West Virginia, the Virginia big-eared bat feeds exclusively on insects. Small moths make up the largest part of this bat's diet.

Additional Comments

The scientific name of this bat was changed recently. In earlier literature this bat is called *Plecotus townsendii virginianus.*

Help

Do not go into any cave that is closed to protect endangered bats, and report anyone who enters a closed cave to your local conservation officer or call the WVDNR Operations Center at (304) 637-0245. Report all sightings of big-eared bats to Bat Report, P.O. Box 67, Elkins, WV 26241 or call the number given above (304) 637-0245.

Pink Mucket Pearly Mussel *(Lampsilis abrupta)*

Common Name
Pink mucket pearly mussel

Scientific Name
Lampsilis abrupt

West Virginia Status
Ohio River (Wood, Mason, Cabell counties), Kanawha R. (Fayette County), Elk River (Kanawha County). This species is listed as federally Endangered by the U. S. Fish and Wildlife Service.

Description
Male oval shaped, shell of female very inflated, almost spherical; shell up to 10.8 cm (4.25 in); light yellow to brown rays in young; nacre white to salmon

Habitat
Freshwater mussels live in a variety of substrates including sand, gravel, cobble and mixed materials on the bottoms of streams and rivers. They generally require free-flowing, clean, well-oxygenated water. Some species such as Pink Mucket Pearly Mussel live in the sediment beneath large rivers.

Threats and Prospects
Because they are sedentary filter feeders, mussels are extremely susceptible to changes in water quality. The creation of dams, levies, channels and the practice of dredging has degraded the habitats of many species in West Virginia. These practices often increase siltation which may smother mussels, choke out their food sources, or harm their host fish. Also, because they are long-lived, mussels are vulnerable to toxins which they can accumulate over a number of years. Land use practices--forestry, mining and agriculture--may also negatively impact mussel populations through erosion, pollution, acid runoff, trampling by livestock and altering water temperatures. Mussels are extremely vulnerable because of their dependence on fish as larval hosts.

Any alteration that affects their host fish, whether detrimental to adult mussels or not, can interfere with their reproductive cycles, and cause population declines. The button industry that once thrived in St. Marys exacted a heavy toll on the thicker-shelled mussels. Mussels are still collected in some states for their role in culturing pearls. Possession of mussels is now illegal in West Virginia, and a permit is required to collect for scientific purposes. The latest scourge to freshwater mussels is a biological one: zebra mussels. These small, non-native bivalves are not dependent on fish hosts, and as a result, can spread extremely quickly. They kill native mussels by encrusting them and intercepting their food and oxygen.


(Photo by Craig Stihler)

Range
Ohio River (Wood, Mason, Cabell counties), Kanawha River (Fayette County), Elk River (Kanawha County).

Life History
Mussels have a complex life history that involves egg, larva, juvenile and adult forms. Reproduction for most species begins in the spring when males release sperm into the water column. Females take up sperm through their siphons. Eggs are fertilized and develop into tiny larvae known as glochidia within the mother's gills. Because of this nurturing role, the shells of the females in some species have a posterior (rear) bulge. Some species of mussels finish incubating their young by the summer while others incubate throughout the fall and winter. Most Unionid mussels depend on one or several fish species to serve as hosts and disperse their developing larvae. Glochidia latch onto the gills or fins of fish from which they derive nutrients before detaching and falling to their new locations. The juveniles, which have taken on a bivalve (adult) form by the time they depart their hosts, spend their first year or two buried in the stream floor where they feed with a fleshy (byssal) foot. Adults embed themselves in the substrate of the stream where they

siphon food items from the passing water. Adult mussels are sessile, seldom moving more than a few meters in their lifetimes. A fleshy foot allows them to adjust their positions within the substrate. In good water conditions, mussels can live from 15 to over 50 years. Some individuals have been known to exceed 100 years of age.

Diet

Freshwater mussels eat a variety of microscopic organisms including algae, diatoms, phytoplankton, zooplankton and detritus which they filter out of the water.

Help

Refrain from collecting native mussels and report those who do to: Division of Natural Resources, P.O. Box 67, Elkins, WV 26241, (304) 637-0245 or your local conservation officer. Also, be aware of any unauthorized stream modification activities in your area and report suspected toxic spills or illegal dumping of wastes to your local Division of Environmental Protection office. Please discard any unused live bait on land or return it to where it was collected. Thoroughly cleanse buckets and boats when going between streams; pests like the zebra mussel can be inadvertently spread by boats and in bait buckets. If you have cattle, keep them from wallowing in streams where they may crush fragile mussels, or restrict their access to a small area in the stream. Promoting streamside vegetation to reduce erosion and shade streams also benefits freshwater mussels.

Rayed Bean *(Vilosa fabalis)*

Common Name
Rayed Bean (freshwater mussel)

Scientific Name
Vilosa fabalis

The rayed bean, a small freshwater mussel of the upper Midwest and Eastern United States, has been proposed for listing as an endangered species. **Photo by USFWS; Angela Boyer**

Status
The rayed bean is a freshwater mussel that the U.S. Fish and Wildlife Service has proposed to list as an endangered species.

Description
The rayed bean is a small freshwater mussel, usually less than 1.5 inches long. Its shell is smooth-textured and green, yellowish-green, or brown with numerous dark-green wavy lines. The male's shell shape is generally elongated, whereas the female's is smaller and elliptical.

The rayed bean historically was found across a wide expanse that included parts of the Midwest, the eastern United States, and north to Ontario, Canada. Once found in at least 112 streams, canals, and lakes, the rayed bean now occurs in only 28 streams and 1 lake; a 75 percent reduction in the number of occupied streams and lakes.

The species has been extirpated from Illinois, Kentucky, Tennessee, and Virginia but is still found in Indiana, Michigan, New York, Ohio, Pennsylvania, West Virginia and Ontario, Canada.

Habitat
The rayed bean generally lives in smaller, headwater creeks, but they are sometimes found in large rivers and wave-washed areas of glacial lakes, including Lake Erie. They prefer gravel or sand substrates, and are often found in and around roots of aquatic vegetation.

Adults spend their entire lives partially or completely buried in substrate, filtering water through their gills to remove algae, bacteria, detritus, microscopic animals, and dissolved organic material for food.

Reproduction
The life cycle of the rayed bean, like most freshwater mussels, is unusual and complex.

The male releases sperm into the water column that is then siphoned by the female to fertilize her eggs. Fertilized eggs develop into microscopic larvae, called glochidia, within special gill chambers. Female mussels expel mature glochidia, which must attach to the gills or fins of a specific host fish species to complete development into juvenile mussels. If successfully attached to a host fish, glochidia mature into juvenile mussels within a few weeks. They then drop from the fish and continue to grow, if they fall onto appropriate substrate. Using fish as a host species allows the rayed bean to move upstream and populate habitats it could not reach otherwise.

Dams
Dams affect both upstream and downstream mussel populations by disrupting natural river flow patterns, scouring river bottoms, changing water temperatures, and eliminating habitat.

The rayed bean also depends on host fish as a means to move upstream. Because dams block fish passage, mussels are also prevented from moving upstream, which isolates upstream mussel populations from downstream populations leading to small unstable populations more likely to die out.

Pollution
Adult mussels are easily harmed by toxins and degraded water quality from pollution because they are sedentary (they tend to stay in one place). Pollution may come from specific, identifiable sources such as accidental spills, factory discharges, sewage treatment plants and solid waste disposal sites or from diffuse sources like runoff from cultivated fields, pastures, feedlots, farms, mines, construction sites, private wastewater discharges, and roads. Contaminants may directly kill mussels, but they may also reduce water quality, affect the ability of surviving mussels to have young, or result in lower numbers or disappearance of host fish.

Sedimentation
Sedimentation can be accelerated by poor land use practices, dredging, impoundments, intensive timber harvesting, and heavy recreational use. Excessive sedimentation suffocates freshwater mussels because it is difficult for them to move away from the threat. Impacts from increased or heavy sedimentation also reduce feeding and respiratory ability for the rayed bean mussel, which can lead to decreased growth, reproduction, and survival.

Nonnative Species
Nonnative zebra mussels have invaded U.S. waters, and pose a serious threat. Zebra mussels proliferate in such high numbers that they use up food resources and attach to native mussel shells in such large numbers that the native mussel cannot eat or breathe. Another invasive species, the round goby, is a nonnative fish that may displace native host fish species, thus reducing reproductive ability of the rayed bean reproduce.

Listing
In 2004, the U.S. Fish and Wildlife Service designated the rayed bean mussel as a candidate species for listing as threatened or endangered under the Endangered Species Act. The Service is now proposing to list it as endangered. If listed, the rayed bean will receive the full protection of the Endangered Species Act (ESA). The ESA would provide protection against certain practices and would require planning for recovery and recovery actions.

Watershed Protection through Partnerships
The rayed bean cannot survive without help from watershed partnerships to restore habitat and improve surface lands. Causes of habitat degradation are numerous in streams throughout its range. In many cases, the threats are not from actions in or adjacent to the rivers where the species is found. Instead, threats are due to widespread problems on uplands at the highest elevations of watersheds. Habitat restoration will require improvements across the entire watershed. The voluntary assistance of Federal and State agencies, conservation groups, local governments, private landowners, industries, businesses, and farming communities will be necessary to meet recovery goals.

Assistance
Learn more about how the destruction of habitat leads to loss of endangered and threatened species and our nation's plant and animal diversity. Discuss with others what you have learned.

Help improve water quality locally in streams by minimizing use of lawn-care chemicals and properly disposing of or recycling hazardous materials found in your home, like batteries, paint, car oil, and pesticides. When boating, please follow any rules established to prevent the spread of exotic pests like the zebra mussel.

U.S. Fish & Wildlife Service 1 Federal Drive Fort Snelling, Minnesota 55111
612-713-5350
http://www.fws.gov/midwest/endangered
November2011

Snuffbox *(Epioblasma triquetra)*

Common Name
Snuffbox (freshwater mussel)

Scientific Name
Epioblasma triquetra

Status
The snuffbox is a freshwater mussel that the U.S. Fish and Wildlife Service has proposed to list as an endangered species.

Description
The snuffbox is a small to medium-sized freshwater mussel with a yellow, green or brown shell that is interrupted with green rays, blotches or chevron shaped lines. The shell becomes darker and the interruptions less clear with age. Shell shape is typically triangular in females and oblong or ovate in males. Males can grow up to 2.8 inches, while females only grow up to 1.8 inches.

Historically the snuffbox was widespread, occurring in 208 streams and lakes in 18 States and Ontario, Canada. The population has been reduced to 74 streams and lakes in 14 States and Ontario, which is a 65 percent rangewide decline. Most remaining populations are small and geographically isolated from one another, further increasing their risk of extinction.

Habitat
The snuffbox is usually found in small to medium-sized creeks in areas with a swift current, although it is also found in Lake Erie and some larger rivers. Adults often burrow deep in sand, gravel or cobble substrates, except when they are spawning or the females are attempting to attract host fish.

Snuffbox are suspension-feeders, typically feeding on algae, bacteria, detritus, microscopic animals, and dissolved organic material.

Reproduction
The life cycle of the snuffbox, like most freshwater mussels, is unusual and complex. The male releases sperm in the water column that is then siphoned by the female to fertilize her eggs. Fertilized eggs develop into microscopic larvae, called glochidia, within special gill chambers. After brooding for up to seven months, the female expels mature glochidia, which then must attach to the gills or fins of a specific host fish species to complete development into juvenile mussels. If successfully attached to a host fish, glochidia mature within a few weeks. Juvenile mussels then drop off and continue to grow, if they fall onto appropriate substrate. Using fish as a host species allows the snuffbox to move upstream and populate habitats it could not reach otherwise.

The logperch is a host fish for snuffbox mussels. In this photo, a logperch approached the female mussel, which then snapped shut. Oftentimes, the mussel will snap closed on a fish's head or snout, ensuring that glochidia are released into the fish's gills. Photo by Dr. Chris Barnhart, Missouri State University

Dams
Dams affect both upstream and downstream mussel populations by disrupting natural river flow patterns, scouring river bottoms, changing water temperatures, and eliminating habitat. The snuffbox, a mussel adapted to living in flowing water habitat, cannot survive in the still water impounded behind dams.

Snuffbox mussels also depend on host fish as a means to move upstream. Because dams block fish passage, mussels are also prevented from moving upstream, which isolates upstream mussel

populations from downstream populations leading to small unstable populations more likely to die out.

Pollution
Adult mussels are easily harmed by toxins and degraded water quality from pollution because they are sedentary (they tend to stay in one place). Pollution may come from specific, identifiable sources such as accidental spills, factory discharges, sewage treatment plants and solid waste disposal sites or from diffuse sources like runoff from cultivated fields, feedlots, farms, mines, construction sites, private wastewater discharges, and roads. Contaminants may directly kill mussels, but they may also reduce water quality, affect the ability of surviving mussels to have young, or result in lower numbers or disappearance of host fish.

Sedimentation
Sedimentation can be accelerated by poor land use practices, dredging, impoundments, intensive timber harvesting, and heavy recreational use. Excessive sedimentation suffocates freshwater mussels because it is difficult for them to move away from the threat. Impacts from increased or heavy sedimentation also reduce the feeding and respiratory ability of snuffbox mussels,. This may lead to decreased growth, reproduction, and survival.

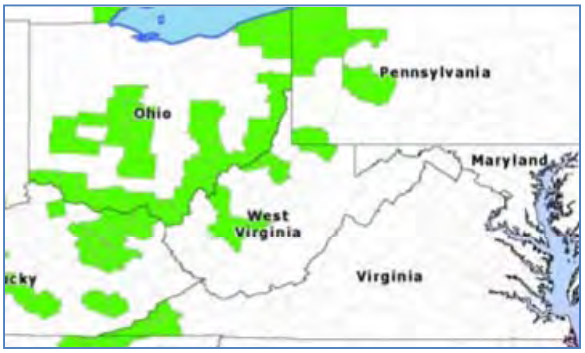
Nonnative Species
Nonnative zebra mussels have invaded U.S. waters, and pose a serious threat. Zebra mussels proliferate in such high numbers that they use up food resources and attach to native mussel shells in such large numbers that the native mussel cannot eat or breathe.

Another invasive species, the round goby, is a nonnative fish that may displace native host fish species, thus reducing reproductive ability of the snuffbox reproduce.

Listing
In 2007, the U.S. Fish and Wildlife Service completed a status assessment for the snuffbox mussel. The Service is now proposing to list it as endangered. If listed, the snuffbox will receive the Endangered Species Act's (ESA) full protection. The ESA would provide protection against certain practices and would require planning for recovery and recovery actions.

Watershed Protection through Partnerships
The snuffbox cannot survive without help from watershed partnerships to restore habitat and improve surface lands. Causes of habitat degradation are numerous in streams throughout its range. In many cases, the threats are not from actions in or adjacent to the rivers where the species is found. Instead, threats are due to widespread problems on uplands at the highest elevations of watersheds. Habitat restoration will require improvements across an entire watershed.

The voluntary assistance of Federal and State agencies, conservation groups, local governments, private landowners, industries, businesses, and farming communities will be necessary to meet recovery goals.



Current range of snuffbox in OH, KY, PA, VA and WV.

Assistance
Learn more about how the destruction of habitat leads to loss of endangered and threatened species and our nation's plant and animal diversity. Help improve water quality locally in streams by minimizing use of lawn-care chemicals and properly disposing of or recycling hazardous materials found in your home, like batteries, paint, car oil, and pesticides. When boating, please follow any rules established to prevent the spread of exotic pests like the zebra mussel.

U.S. Fish & Wildlife Service 1 Federal Drive, Fort Snelling, Minnesota 55111 612-713-5350
http://www.fws.gov/midwest/endangered
October 2011

Virginia Spiraea *(Spiraea virginiana)*

Common Name
Virginia Spiraea

Scientific Name
Spiraea virginiana

Status
Virginia spiraea is classified as a Threatened under the Federal Endangered Species Act.

West Virginia Status
This spiraea is found on 24 stream systems in 7 states. Of these known sites 14 populations have fewer than 10 clumps of the shrub, 8 consist of 10-50 clumps and only 3 contain more than 50 clumps. Six extant populations occur in West Virginia with an estimated 1,000 to 4,000 individuals, by far the most of any state. Plants occur in West Virginia along the Gauley, Meadow, Bluestone, and Greenbrier rivers. The Gauley River Gorge below Summersville Dam harbors what is thought to be the world's largest population.

Description
Virginia spiraea is a colonial shrub ranging in height from 3 to 7 feet. Each clone consists of a number of erect or arching stems arising from an underground rootstock. The leaves are simple, deciduous, alternately arranged along the stem. The size and shape of the leaves are extremely variable; the usual length is 2-4 inches and elliptic in outline. The flowers, found in June and July, are white and occur in groups at the end of leafy branches.

Habitat
The seven states in which Virginia spiraea occurs are Georgia, Tennessee, North Carolina, Kentucky, West Virginia, Virginia, and Ohio. Habitat is usually rocky, flood scoured banks of high-energy (high gradient) streams or rivers. Flood scouring may be important to this species by preventing canopy closure and creating river wash deposits, thereby decreasing competition from larger trees and providing an appropriate rooting medium. One site in the state is along a two lane highway. While wetland borders the roadway there is no stream and this lends a little mystery as to why the plant occurs here. An additional site was found nearby between a drainage ditch and mine waste piles that may have been brought in with fill material of unknown origin. No other populations are known in the area.

Factors
Because Virginia Spiraea is primarily a shrub that grows between forested slopes and the rocky shores of high-energy rivers, the factors that most affect the species are those that either eliminate its habitat altogether, or reduce the moderate level of flood-scouring it seems to require. It is thought that the scouring reduces competition from native and non-native plants that would otherwise crowd it from the limited substrate or reduce its access to sunlight.


(Photo by Craig Stihler)

According to the U.S. Fish and Wildlife Service, suitable habitat has been eliminated at former sites throughout the range of the species by reservoir construction. Furthermore, they conclude that population sites may face the potential indirect threats of upstream and downstream water stabilization, which would eliminate or reduce scouring action necessary to maintain open habitat for the species. Historically known populations have been destroyed along the Monongahela River by the construction of navigation facilities, and along the New River by the construction of a hydroelectric dam at Hawks Nest. A third population on the Buckhannon River apparently did not recover from severe flooding events and can no longer be found.

One of the threats to West Virginia populations of Virginia Spiraea that we see at almost all sites is damage to individual plants and to their habitat by recreational users of the rivers upon which they occur. Populations along the Gauley, Meadow, Bluestone, and Greenbrier Rivers are being impacted by the clearing of riverside sites for fishing, camping, and rafting. Overuse by hikers, fishermen, and boaters has resulted in breakage of the fragile stems of these plants. Botanists have not seen seedlings at any population, and attempts to germinate seeds by various workers have been only slightly successful.

Threats and Prospects

Many miles of streamside habitat has been lost through reservoir construction. Summersville Dam eliminated about one-third of the habitat along the Gauley River. The perpetuation of this species will require streamside habitat with natural flood regimes. All remaining habitat should remain undammed so that these natural processes can help maintain appropriate habitat. The entire Gauley River canyon below Summersville Dam has been cut off from naturally occurring flood events due to the regulation of water flows through the dam. Long-term it is possible that this will increase vegetation along the shores and create enough competition to displace the Virginia Spiraea growing there. If this is the case then the world's largest population could be in trouble over the next fifty to one hundred years. If streams harboring the species are left undammed and recreational development takes the habitat needs of the species into account then the Virginia Spiraea should continue to occur as a rare species in the east-central United States.

Small Whorled Pogonia *(Isotria medeoloides)*

Common Name
Small Whorled Pogonia

Scientific Name
Isotria medeoloides

Status
Small whorled pogonia is listed by the U.S. Fish and Wildlife Service as federally Threatened. Nature Serve posts a Global Heritage Status Rank of G2 for it. As of 1993, one hundred four extant sites were known.

West Virginia Status
This plant was not known from West Virginia until its discovery in 1996. There are two populations of this species recorded to date in the state, with only one to three plants in each.

Description
This is an herbaceous perennial plant of the Orchid Family (Orchidaceae). Orchids are perennial herbs with two-ranked leaves, three-merous irregular (zygomorphic) flowers, usually with three specialized structures: a lower petal modified into a lip (labellum), pollen that is usually agglutinated into a waxy or mealy mass (pollinia), and a complex structure composed of the stigmas, styles and the androecium (all the anthers) combined, called a column or gynandrium. Orchids have an inferior ovary. Small whorled pogonia grows to three dm in height, and has a whorl of five to six leaves near the top of the stem and beneath the flower(s). It reappears in the spring from a perennial underground rootstock, the stems usually single, occasionally in groups of two or three. Leaves and stems are grayish-green, the color of a glaucous green grape. Solitary or occasionally paired greenish-yellow flowers arise from the whorl of leaves in late May to early June in West Virginia, but this species flowers rarely, an individual characteristically waiting 7-8 years before flowering again. Small whorled pogonia can be distinguished in vegetative state from two other 'look-alike' plants that bloom at the same time and grow together (Table 1).


(Photo by Clete Smith)

Habitat
Small whorled pogonia grows in a variety of woodland or forested habitats. In New England, it is found in high acidity soils, generally where a fragipan layer can be found, and where lateral water drainage is pronounced. However, in other parts of its range, it occurs on somewhat "richer", more calcareous sites. Populations in Virginia, grow in mesophytic, mixed deciduous to mixed deciduous and conifer forests, in gently sloping to moderately sloping terrain, in secondary to tertiary forests. Some sites there are very dry sites with very acidic sandy loam soils, and cobbles of quartzitic sandstone and quartzite. Other sites in Virginia are more mesic, and plants are found 20 feet up-slope from an intermittent drainage.

At the far extreme, another site in Virginia is within a mature forest of 80+ year old oaks and tulip trees, with an understory of white oak and American beech. This site is very shaded. At all of these sites, small whorled pogonia emerges from 2-3 inches of deciduous leaf litter, and at most sites, the plants can be found growing with large whorled pogonia orchids and Indian cucumber root plants. It's hard to characterize the habitat in West Virginia for small whorled pogonia with only two sites discovered to date. The first site is located at the base of a

moderately steep, mesic, northeast-facing slope, in filtered sunlight. It is within a second-growth mixed mesophytic forest, with white oak, witch hazel, Virginia pine, and flowering dogwood. The second site is located in a dry mixed oak forest, with scarlet oak, white oak, red oak, black oak, white pine, mountain laurel, squaw huckleberry, beneath tulip tree and red maple. The area is over Pocono sandstone.

Factors

The principle threat to this species is the cutting of forest habitats and conversion of the landscape to other land uses, such as housing and business developments, and golf courses. Digging of plants is a real threat too, as this orchid species does not transplant successfully. Since the plants are small and difficult to see coming through the deciduous leaf litter, it is suspected that other plants have not yet been discovered, but likely exist in West Virginia.

Threats and Prospects

One small whorled pogonia site in West Virginia is on private land, and no protective agreements have been made with the landowner to date. The other population site, on federal land, should survive if properly managed. Additional survey work is needed to fully understand the distribution of the species in our state.

Table 1. *Comparison of Identification Traits Among Three Herbaceous Perennials in Vegetative State*

	Small Whorled Pogonia (*Isotria medeoloides*)	**large whorled pogonia** (*Isotria verticillata*)	**Indian Cucumber Root** (*Medeola virginiana*)
Stem	color of green grape (glaucous)	purple at the very base of the stem and sometimes up the stem at least halfway. Often pubescent with grey hairs.	yellow-green, thin and wiry often with arachnoid hairs along the stem
Whorl of Leaves	glaucous; grey-green	darker green than those of small whorled pogonia. Not glaucous (though leaves may be somewhat so underneath)	yellow-green; flowering stems with two sets of whorls

Fanshell *(Cyprogenia stegaria)*

Common Name
Fanshell

Scientific Name
Cyprogenia stegaria

West Virginia Status
Fanshell is listed by the United States Fish and Wildlife Service as federally Endangered.

Description
Roundish shell under 8.1 cm. (3.2 in) long, light green or yellow with green rays; nacre (inner shell surface) silvery white.

Habitat
Freshwater mussels live in a variety of substrates including sand, gravel, cobble and mixed materials on the bottoms of streams and rivers. They generally require free-flowing, clean, well oxygenated water. Fanshells live in the sediment beneath large rivers.

Threats and Prospects
Because they are sedentary filter feeders, mussels are extremely susceptible to changes in water quality. The creation of dams, levies, channels and the practice of dredging have degraded the habitats of many species in West Virginia. These practices often increase siltation which may smother mussels, choke out their food sources, or harm their host fish. Also, because they are long-lived, mussels are vulnerable to toxins which they can accumulate over a number of years. Land use practices--forestry, mining and agriculture--may also negatively impact mussel populations through erosion, pollution, acid runoff, trampling by livestock and altering water temperatures. Mussels are extremely vulnerable because of their dependence on fish as larval hosts. Any alteration that affects their host fish, whether detrimental to adult mussels or not, can interfere with their reproductive cycles, and cause population declines.

The button industry that once thrived in St. Marys exacted a heavy toll on the thicker-shelled mussels. Mussels are still collected in some states for their role in culturing pearls. Possession of mussels is now illegal in West Virginia, and a permit is required to collect for scientific purposes. The latest scourge to freshwater mussels is a biological one: zebra mussels. These small, non-native bivalves are not dependent on fish hosts, and as a result, can spread extremely quickly. They kill native mussels by encrusting them and intercepting their food and oxygen.

Range
Found in the Ohio River basin from Illinois across to Alabama, Virginia, West Virginia and Pennsylvania. In West Virginia it is thought to exist in the Kanawha River (Fayette, Kanawha Counties), Ohio River (Wood County) and (Jackson County).

Life History
Mussels have a complex life history that involves egg, larva, juvenile and adult forms. Reproduction for most species begins in the spring when males release sperm into the water column. Females take up sperm through their siphons. Eggs are fertilized and develop into tiny larvae known as glochidia within the mother's gills. Because of this nurturing role, the shells of the females in some species have a posterior (rear) bulge. Some species of mussels finish incubating their young by the summer while others incubate throughout the fall and winter.

Most unionid mussels depend on one or several fish species to serve as hosts and disperse their developing larvae. Glochidia latch onto the gills or fins of fish from which they derive nutrients before detaching and falling to their new locations. The juveniles, which have taken on a bivalve (adult)

form by the time they depart their hosts, spend their first year or two buried in the stream floor where they feed with a fleshy (byssal) foot. Adults embed themselves in the substrate of the stream where they siphon food items from the passing water. Adult mussels are sessile, seldom moving more than a few meters in their lifetimes. A fleshy foot allows them to adjust their positions within the substrate. In good water conditions, mussels can live from 15 to over 50 years. Some individuals have been known to exceed 100 years of age.

Diet

Freshwater mussels eat a variety of microscopic organisms including algae, diatoms, phytoplankton, zooplankton and detritus which they filter out of the water.

Help

Refrain from collecting native mussels and report those who do to: Division of Natural Resources, P.O. Box 67, Elkins, WV 26241, (304) 637-0245 or your local conservation officer. Also, be aware of any unauthorized stream modification activities in your area and report suspected toxic spills or illegal dumping of wastes to your local Division of Environmental Protection office. Please discard any unused live bait on land or return it to where it was collected. Thoroughly cleanse buckets and boats when going between streams; pests like the zebra mussel can be inadvertently spread by boats and in bait buckets. If you have cattle, keep them from wallowing in streams where they may crush fragile mussels, or restrict their access to a small area in the stream. Promoting streamside vegetation to reduce erosion and shade streams also benefits freshwater mussels.

Shale Barren Rockcress *(Arabis serotina)*

Common Name
Shale Barren Rockcress

Scientific Name
Arabis serotina

Status
Shale barren rockcress is listed by the United States Fish and Wildlife Service as federally Endangered and is being protected from destruction on federal lands.

West Virginia Status
Shale Barren rockcress is known to grow in West Virginia and in approximately 35 sites in Virginia. Many of these areas contain less than 10 plants. The number of these plants growing at a site may change greatly from year to year due to unknown factors, so it is difficult to know how many total plants actually exist.

Description
The plant is called a cress because it is part of a group of wild plants, the "mustards," whose leaves are tangy and some species can be eaten by humans. The leaves are more often eaten by insects and other herbivores. The first two words of the name refer to the plant's habitat: shaley, steep, usually dry hillsides known as shale barrens. It is the rarest of the plants which grow on shale barrens, and restricted almost exclusively to them. Shale barren rockcress is usually considered to be a biennial plant, in that after a seed sprouts, leaves grow in a small circular cluster next to the ground during the first year. This group of leaves is called a rosette, and they remain alive through their first winter and into the second year when the plant may produce flowers near the end of summer. Field observations of the species have lead us to suspect that a given rosette may not produce a bolt of flowers for as much as 5 years, or whenever conditions are favorable. To produce flowers, a stem grows upward from the rosette to a height of about 60 centimeters (about 2 feet) and may have many branches. Small flowers and a few small leaves grow from these branches. New rosettes usually sprout from seeds although they may occasionally sprout from other rosettes.

Habitat
The shale barrens, where this rockcress grows, have soil which contains many hard, small shale fragments. The hillsides typically face the south or the east, so they get very hot during summer days. Shale barrens occur on Devonian-aged shale exclusively in the Valley and Ridge Geographic Province of the Allegheny Mountains. Only a few types of plants can survive on shale barrens. These plants include pines, oaks, and junipers along with a sparsity of non-woody plant species. This is most likely because the tiny fragments of shale, called channers, tend to cascade down the steep slopes making the substrate unstable for most young plants to get started. Plus, on hot August days, few seedlings can survive temperatures of up to 110 degrees Fahrenheit, six inches above the surface of the shale slope.

Shale barren rockcress does not grow on all the shale barrens in West Virginia and Virginia. It has been found in only three counties in West Virginia (Greenbrier, Pendleton, and Hardy) and in four counties in Virginia (Highland, Bath, Rockbridge, and Augusta). Although there are similar shale barrens in parts of Maryland and Pennsylvania, this plant does not grow there.

Factors
Recently, several new roads have been built directly through places where shale barren rockcress had

been growing. In West Virginia, five shale barrens where the rockcress grows have been partially destroyed by road construction, and a sixth was degraded by a small flood-control dam. Three shale barrens in Virginia that contain the rock cress have been partially destroyed by road construction, two were damaged by railroad construction, and one is crossed by a hiking trail. Hikers may accidentally step on these plants, plus excessive foot travel can damage shale barrens. In addition, deer and insects find shale barren rockcress palatable. Recently, much deer damage to flowering plants of this species has been observed.

Threats and Prospects

More information about how shale barren rockcress grows and reproduces needs to be obtained. Within recent years, more populations have been discovered in Virginia and West Virginia with the aid of aerial infra-red photography to locate potential sites, followed by on-site exploration. There are still many things about the plant that are uncertain. Because it only grows in a few places, these places need to be studied to find out what shale barren rockcress needs in order to survive. Shale barren rockcress is not currently protected by any state or local laws or regulations. This means that private land owners are not restricted in what they do on their land where the rockcress is growing. Some observations suggests that some shale barrens may not always remain barren and dry. Over time, it is possible for conditions there to change, and more trees may eventually grow on them. If more trees grow there, shale barren rockcress may not be able to survive. Therefore, the question of whether humans should try to keep the shale barrens in an open condition may be considered in the future.

Indiana Bat *(Myotis sodalis)*

Common Name
Indiana Myotis/Indiana Bat

Scientific Name
Myotis sodalist

Status
The U.S. Fish and Wildlife Service lists the Indiana myotis as Endangered throughout its range.

West Virginia Status
West Virginia is on the edge of the range of this species, but significant numbers of these bats hibernate in certain West Virginia caves. This bat has been reported from caves in the eastern highlands of the state. Populations are increasing as a result of protection efforts. Until 1995, the Indiana myotis was not documented as a summer resident of the state. During the summer of that year, a few male Indiana myotis were captured in Tucker County.

Description
The Indiana myotis is a rather nondescript small brown bat with a wingspan of approximately 240 to 265 millimeters (9.5-10.5 inches). This bat is very similar in appearance to the common little brown myotis (a bat often found in houses), but can be distinguished by the duller luster of its fur and toe hairs that do not extend beyond the tips of the claws. The Indiana myotis also has a more pinkish colored nose. The calcar (the cartiladge which extends from the ankle to support the tail membrane) of the Indiana myotis usually has a keel, but this is often difficult to see. During hibernation Indiana myotis congregate in more densely packed clusters than other bats in its range.

Habitat
Caves are important for the Indiana myotis. During the winter, large numbers of Indiana myotis gather in a few caves which provide suitable conditions for hibernation. These caves usually have fairly stable winter temperatures ranging from 2.8 to 6.1 degrees centigrade (37 to 43 degrees Fahrenheit) and a high relative humidity (66% to 95%). The summer habitat of this species was almost unknown until recently, and it is still poorly understood. During the summer, females form small colonies under the loose bark of trees. Here they raise their young. Males also appear to form small colonies in trees, either in hollow trees or under loose bark. Feeding areas for the Indiana myotis consist of wooded habitats. Early studies indicated that wooded areas along rivers were the preferred feeding areas, but more recent studies suggest that upland forests are also used.

Threats and Prospects
Because these bats are concentrated into just a few caves during the winter, they are very vulnerable to disturbance. It is estimated that 94% of the population winters in only 13 caves, and one cave in Pendleton County harbors over 90% of the Indiana myotis in West Virginia. Indeed, disturbance by cavers during the winter is probably the major factor leading to the decline of the species. Indiana myotis are more sensitive to disturbance than most other bats, and each time the bats awaken during the winter, valuable fat reserves are used up. Repeated disturbances can leave the bats with too little fat to survive the remainder of the winter. Contamination of their food supply through the use of pesticides in agricultural areas and loss of summer habitat may also be contributing to the species' decline. Eight caves in West Virginia are closed to human traffic from September 1 to May 15 to protect hibernating Indiana myotis. Gates and fences have been constructed at some of the cave entrances to keep exclude people. Indiana myotis populations in these caves are increasing, and some are now equal to or above the population levels observed in the 1950's and 1960's. The species seems to be recovering, but populations in some mid-western caves are still declining, even where the cave is protected. This suggests that there may be problems in the bats' summer habitats. Much still needs to be


(Photo by Craig Stihler)

learned concerning the summer requirements of this species.

Range
The range of the Indiana myotis includes much of the Midwestern and Eastern United States from the Ozark Mountains to southern Wisconsin and Michigan to central Vermont and south to northwestern Florida. In West Virginia it has been reported from caves in Greenbrier, Hardy, Monroe, Pendleton, Pocahontas, Preston, Randolph, and Tucker counties.

Life History
During the autumn, Indiana myotis put on extra body fat in preparation for hibernation. Wintering bat concentrations begin to assemble in mid-September. The bats feed on warm nights into late fall, but enter hibernation as insects become less abundant. By late-November, most bats have settled in for the winter. Where conditions are suitable, large numbers of Indiana myotis may gather in tightly-packed clusters (up to 300 per square foot) on the cave ceiling. During hibernation all body functions are reduced including heart rate and breathing, and the bat's body temperature drops to nearly that of the cave. By lowering their metabolic rate, these animals can survive the winter on stored fat. To find their way in the total darkness of the caves were they hibernate; the bats rely on a sensitive "echolocation" system. They emit ultrasound clicks (above the hearing range of humans) and listen to the echo to determine if there is an object in front of them. They can detect objects as fine as monofiliment fishing line. Indiana myotis mate in the fall before entering hibernation, but the young do not develop until the following spring. Little is known about the rearing of the young, but the females appear to give birth to a single "pup" around June. The young are born blind and naked. Nursed on their mothers' milk, the pups develop rapidly and can fly within 4 to 5 weeks. Summer habitat may be many miles from the cave where the bats hibernate.

Diet
Like all bats in West Virginia, the Indiana myotis feeds solely on insects. Their diet probably consists of flies and, to a lesser extent, moths and other insects.

Additional Comments
The common names of bats in the genus Myotis have been changed recently, and now the term "myotis" is used rather than "bat." Thus the little brown bat is now known as the little brown myotis, and the Indiana bat is now the Indiana myotis.

Help
Avoid going into any closed caves during the official closure period and encourage others to do likewise. If you find what you think are Indiana myotis (very tightly packed clusters of small brown bats) in a cave that is not closed, please report this information to the Endangered Species Program at (304) 637-0245 or write Bat Report, P. O. Box 67, Elkins, WV 26241

Candy Darter *(Etheostoma osburni)*

Common Name
Candy Darter

Scientific Name
Etheostoma osburni

Status
The candy darter is designated as a Species of Concern by the U.S. Fish and Wildlife Service.

West Virginia Status
The candy darter was first collected by native son John Addair of Welch while conducting a fishery survey of the Kanawha Valley of West Virginia. He captured it from Stoney Creek in Pocahontas County on June 17, 1931 and allowed Carl Hubbs of Michigan State University and Milton B. Trautman of Ohio State University to prepare its scientific description. Addair eventually collected this fish from eight additional sites in the upper Kanawha River drainage (i.e., above Kanawha Falls which is at Glen Ferris, WV) and these data were virtually all that was known about this species' distribution and abundance until recently.

Surveys conducted by regional educational institutions and the Division of Natural Resources during the 1970's greatly expanded the database for the candy darter. Their data revealed that this fish was fairly widespread and common within its range, and was definitely restricted to the Gauley and New river drainages. However, the current status of candy darter is uncertain, as surveys conducted during 1990 by WV University personnel suggest that it may be declining.

Description
The image of a darter is not familiar to most Americans. Due to its small size (the majority never reach four inches) most people would probably categorize this fish as a "minnow". A member of the perch family and closely related to the walleye, sauger and yellow perch, darters are restricted to North America east of the Rocky Mountains and number about 150 in all. These fishes have two dorsal or top fins (the front one is spiny and back is soft rayed) and very large pectoral fins.

The candy darter is fairly easily to identify from other darters when observed from above because of five distinctive black saddles across its back; the first and largest starts immediately in front of the spinous dorsal fin, the second is centered between the two top fins, and the last three are evenly spaced from the middle of the second dorsal to the base of the caudal or tail fin. Additional characters used to separate it from other darters are the presence of 9-11 vertical bars on its sides and the number of lateral line scales, which number 58-70 (as counted from the edge of the gill cover to the base of the caudal fin). Male candy darters are considered by some to be the most colorful animals in the world.

The males, especially in the spring spawning season, are very ornate. The 9-10 vertical bars are blue-green and are bordered by narrow, brilliant red bars (haloed in white). A dark vertical bar below the eye is followed by a rather large red (or white when not in spawning season) patch on the cheek. The first dorsal fin has a distinct red margin with a blue-green band below; the pectoral, anal, caudal and soft dorsal fins have red spots and varying degrees of blue-green interspersed; the pelvic fins are usually just dark blue-green with a light edge. Females are much more subdued showing the distinct black dorsal saddles and an overall olive hue; the lateral vertical bars are present but are usually only visible toward the tail-end of the fish.

Habitat
The candy darter inhabits riffles and runs of small cool and warm streams and rivers. Adults are usually

found in large rubble to boulder substrates in the swiftest portions of their fast flowing habitat.

Threats and Prospects
Although the water quality of our nation's waterways has improved immensely in the past 20 years, many native fish populations are apparently still disappearing. Virginia populations of the candy darter are consistent with this imperiled trend, as records show it has become more rare in recent years. In West Virginia the status of this species is presently under evaluation by the WV Division of Natural Resources. Preliminary data are encouraging because candy darters are still fairly common at many historic locations.

Range
The candy darter is found only in the upper Kanawha River System of West Virginia and Virginia. The majority of its range (at least 80%) is found in West Virginia's Gauley, Greenbrier and Bluestone river drainages; in Virginia, it is apparently restricted to eight streams and the main channel New River, all immediately above our state line.

Life History
From 1932 when it was described, until 1990, this darter's common name was known as the finescale saddled darter. In 1991 the name was changed to the candy darter. Very little is known about the life history of the candy darters. Apparently, this species does not live long, as they sexually mature within two years and die in their third year. Males typically grow larger than females, but neither sex reaches over four inches in total length. Spawning usually occurs in April and May, possibly when water temperatures range from 59 - 65 degrees F (15 - 18 degrees C).

Diet
As do most darters, this species preys primarily on aquatic insects. A typical meal includes mayflies, caddisflies, and true flies (mainly midge larvae).

Help
You can help this and other nongame species by reporting stream disturbance violations. Many mountain species like the candy darter have narrow tolerances to siltation sedimentation and water temperature changes. Stream alterations such as bulldozing large rubble and boulders onto the banks, altering the channel course, and eliminating trees (which stabilize banks and provide shade) can have severe negative effects on many small stream species. You may report potential illegal stream activities to the Division of Natural Resources at the Elkins (304-637-0245) or Charleston offices (304-558-2771) or the Division of Environmental Protection (1-800-472-8286).

Woodrat (*Neotoma magister*)

Common Name
Allegheny Woodrat

Scientific Name
Neotoma magister

Status
The U.S Fish and Wildlife Service considers the Allegheny woodrat a Species of Concern.

West Virginia Status
The Allegheny woodrat is more abundant in W.V. than the states to the northeast although it may be declining in the easternmost counties (Berkeley and Jefferson) of the state.

Description
The Allegheny woodrat is a medium-sized rodent with a long, hairy tail. It can be distinguished from the comparably-sized Norway and black rats by its soft, silky fur, large ears and eyes, blunt nose, and hairy, bicolored (dark on top, light underneath) tail. The adult woodrat ranges from 38 to 47 cm. (15 to 19 in.) from the end of its nose to the tip of its tail, and weighs up to 480 grams, (approximately 1 pound). Its fur is brownish gray above and whitish gray beneath. The tidy, meticulous habits of this rodent (also known as packrat) further distinguish the woodrat from its urban cousins.

Habitat
Allegheny woodrats live almost exclusively in rocky areas such as caves, deep crevices, and large boulder fields. Most woodrat dwellings are located in or around hardwood forests that have an abundance of oaks and other mast-bearing trees. The woodrat is also known to occur in northern hardwood (beech, birch, maple) and oak-pine forests. Woodrats are seldom found in agricultural or residential areas.

Threats and Prospects
Scientists have identified several factors that may be contributing to the decline of the Allegheny woodrat. Some cite the gypsy moth, which has been spreading south into the oak forests where woodrats live, as the culprit. Defoliation by gypsy moth larvae can severely weaken oak trees, reducing the acorn crops on which woodrats rely for food in the winter. A second threat to the woodrat is a parasite, the raccoon roundworm (*Baylisascaris procyonis)*, that is carried by raccoons. The raccoon roundworm, which does not severely harm raccoons, causes death in woodrats by attacking their central nervous systems. With their tendency to collect debris, including the scats of other animals, woodrats are especially susceptible to contracting this disease from raccoon feces. Habitat degradation and fragmentation may also be playing a role in the woodrat's decline throughout much of its range. Because of their tendency to inhabit remote places, woodrats generally have not been severely impacted by human activities. Scientists in other states are experimenting with vaccines to reduce the occurrence of raccoon roundworm in their natural hosts. In West Virginia efforts have begun to control gypsy moths with insecticides. However, until more is known about the exact mechanisms that are suppressing woodrat populations, little more than monitoring can be done.


(Photo by Craig Stihler)

Biologists with the West Virginia Division of Natural Resources are monitoring several woodrat populations to obtain long-term data on population trends.

Range
Historically, the Allegheny woodrat occupied a range extending from southwestern New England along the Appalachian Highlands to northern

Alabama and across eastern Tennessee and Kentucky into southern Ohio and Indiana. The woodrat has declined swiftly and severely in the northern part of its range--Pennsylvania, Maryland and New Jersey--and is now considered to be absent from Connecticut and New York.

Life History

Woodrats are active throughout the winter. Around March they mate, and after approximately thirty-five days the female gives birth to between two and four young. During their early days the young, eyes closed and naked, cling firmly to their mother. Their eyes open within 20 days and they are weaned within four weeks of birth. Females typically have two to three litters per year. Most woodrats do not reach sexual maturity until their second year. Except for periods of breeding and young rearing, woodrats are solitary animals and often defend their territories against intruders. They construct “houses” that consist of one or two nests, caches of acorns and other food items, and piles of debris found in the area. It is thought that these piles of leaves, twigs, and litter help to alert the woodrats when predators or other woodrats come around. Woodrats have glands on their ventral (stomach) sides that secrete an odor allowing them to mark their territories. Woodrats are primarily nocturnal, meaning that they are most active at night. They exit their quarters after dark to forage and gather nest materials. Their acute senses of smell and hearing, large eyes, and long whiskers allow these animals to effectively navigate through their dark, underground caverns. It has been suggested that woodrats mark their trails with urine and use the odor to retrace their way to and from their quarters. Predators of the woodrat include owls, foxes, raccoons, opossums, and large snakes.

Diet

Woodrats are herbivores: they rely almost exclusively on plant materials for their food. Among their favorite foods are acorns and other nuts, berries, twigs, leaves and fungi. Occasionally they may feed on snails, insects or other invertebrates. In Autumn woodrats habitually cache (store) large quantities of acorns, twigs, leaves, and other edible vegetation to ensure a constant food supply throughout the winter months.

Help

If you see a rat-like mammal in what appears to be woodrat habitat, do not harm the animal; let it go about its business. Please report any woodrat sightings with a map to Woodrat Sighting, WVDNR, P.O. Box 67, Elkins, WV 26241 or call (304) 637-0245. This will help us better determine this animal’s range in West Virginia

Running Buffalo Clover *(Trifolium stoloniferum)*

Common Name
Running Buffalo Clover

Scientific Name
Trifolium stoloniferum

Status
Running buffalo clover is listed as an Endangered species by the U.S. Fish and Wildlife Service.


(Photo by Bill Roody)

West Virginia Status
This species was thought to be extinct from West Virginia, and possibly its entire range, until it was rediscovered in the New River Gorge in 1983. It is now known from 35 sites within West Virginia; however, three of the sites are pre-1945, and one hasn't been seen since 1988. Running buffalo clover currently inhabits Barbour, Brooke, Fayette, Pendleton, Pocahontas, Randolph and Tucker counties. Past populations were known from Monongalia, Preston and Webster counties. A population at Crouch Knob in Randolph County is the largest in the world.

Description
Running buffalo clover is a perennial species, appearing each spring at the same site and dying off in late summer/early fall. This plant is called running buffalo clover because of the stolons, or runners, that extend from the base of erect stems. These stolons are capable of rooting and expanding the size of small clumps of clover into larger ones. The flower of this clover, which is on a stem with a pair of leaflets (unlike other clovers), is white tinged with purple. It flowers from May through July. While many clovers have arrow-shaped "watermarks" on their leaves, running buffalo clover lacks these marks. This species often appears to be more robust than other white clovers. This plant often grows in small clumps along old roads, skid rows, old game trails, and other disturbed areas. A literature search was conducted in 1989 for references to elk, deer, bison, Indian trails, salt licks, and clover. A map of bison trails evolved from this research. Hoping to find a connection between game trails and running buffalo clover sites, botanists scoured the state surveying areas along major game trails for the clover. A few sites for the clover were found along or near past game trails.

Habitat
The suspected distribution of running buffalo includes the states of West Virginia, Ohio, Kentucky, Indiana, Illinois, Missouri, Kansas and Arkansas. To date the species has not been relocated in Illinois, Kansas and Arkansas. In Missouri, running buffalo clover was found growing on a load of topsoil, but the source of the topsoil could not be found. Running buffalo clover is most frequently found in habitats with filtered sunlight that have had some kind of recent disturbance. Range-wide this clover's habitats include cemeteries, Indian mounds, dooryards, historical homesites, mowed paths, jeep trails, grazed ravines and woodlots. In West Virginia running buffalo clover has been found on jeep trails, old logging roads, skid roads, and wooded thickets.

Factors
The greatest threats to this species appear to be major disturbances, such as road construction, that completely destroy the clover's habitat, and the slow maturation of the habitat through succession. It is hard to determine what can threaten a species which needs disturbance to survive.

Threats and Prospects
Although the number of sites for this species is increasing, relatively little is known regarding the

basic biology of running buffalo clover. More work needs to be done to determine its historic distribution, ecology, and the level of disturbance this species can tolerate. Factors affecting seed germination, such as the role of herbivores, also need to be determined. Despite the increase in the number of populations, running buffalo clover is still listed as an endangered species, and will remain so until more is known about this unique clover.

West Virginia Northern Flying Squirrel *(Glaucomys subrinus fuscus)*

Common Name
Northern Flying Squirrel

Scientific Name
Glaucomys sabrinus fuscus

Status
Although northern flying squirrel populations are stable throughout much of the species' range, the U.S. Fish and Wildlife Service officially listed the two southern Appalachian subspecies as Endangered in 1985. One subspecies is found in West Virginia and an adjacent county of Virginia; the other subspecies occurs in North Carolina, Tennessee, and extreme southwestern Virginia.

West Virginia Status
The subspecies which occurs in West Virginia was first described in 1936 based on a specimen captured near Cranberry Glades, Pocahontas County. In West Virginia, the northern flying squirrel is now known from 90 sites in higher elevations.

Description
The northern flying squirrel is a small, nocturnal mammal weighing 90-148 grams (3.2-5.2 ounces) and measuring 260-305 millimeters (10.25 to 12.0 inches) in total length (tip of nose to tip of the last tail bone). It has a long, broad, flattened tail, very large, dark eyes, and thick, silky fur. The fur is light brown to reddish brown in color while the belly fur is mostly white. The distinctive patagia (folds of skin between the ankles and wrists) and the broad tail allow the squirrel to glide from tree to tree; bats are the only mammals that can truly fly. There are two species of flying squirrels found in West Virginia, the northern flying squirrel and the southern flying squirrel (*Glaucomys volans*). The endangered northern flying squirrel can be distinguished from the common southern flying squirrel by its larger size and greater adult weight (90-148 grams (northern) vs. 50-90 grams (southern)), the dark tip of its tail, and belly hairs which are gray at the base and white at the tip as opposed to the entirely white hairs of the southern flying squirrel. The coloration of the northern flying squirrel is "richer" than the relatively dull and paler southern flying squirrel.

Habitat
As its name implies, the northern flying squirrel is typically found in boreal habitats, especially spruce/fir/hemlock and northern hardwood forests. In West Virginia, this squirrel is usually associated with red spruce and northern hardwoods such as sugar maple, black cherry, American beech, black birch, and yellow birch. These habitat types are most common in areas over 909 meters (3,000 feet) in elevation. Most known occurrences of the northern flying squirrel are in moist forests with at least some mature trees, standing snags, and downed logs; lichens and mosses are often abundant. In the southern Appalachians, northern flying squirrels tend to occupy small and potentially vulnerable islands of high elevation habitat.


(Photo by Larry Master)

Threats and Prospects
The northern flying squirrel has been protected under the Endangered Species Act since 1985. The main threat to this animal is loss of habitat (high elevation red spruce forest) to timbering and development. As a result of extensive logging, there is less red spruce forest in West Virginia today than there was before the timber boom around the turn of the last century. However, many areas in the higher elevations are coming back as red spruce forest,

although it will be many years before much of this forest is mature and suitable northern flying squirrel habitat. There is also some concern that the more common southern flying squirrel may be displacing the northern flying squirrel in some areas. Some types of habitat changes may favor the southern flying squirrel over the northern. Recent surveys, conducted through the placement and monitoring of nest boxes or by live-trapping, have shown the northern flying squirrel to be more widespread and abundant than was thought in 1985. When the subspecies was listed, there were only ten documented captures of this squirrel in West Virginia. By the middle of 1996, there were 779 recorded captures at 84 sites in the state. Most of the known locations of this squirrel are within the Monongahela National Forest and are protected. Under the present Forest Management Plan, all habitat within 0.83 kilometers (0.5 mile) of a northern flying squirrel capture site is protected. The U. S. Fish and Wildlife Service is reviewing the status of this subspecies to determine if it should be "downlisted" from endangered to threatened status based on the results of recent surveys and protection efforts.

Range

Northern flying squirrels occur in boreal evergreen and mixed northern hardwood/evergreen forests of the northern United States and Canada, the mountain ranges in the western United States, and certain high elevation areas of the Appalachian Mountains. The subspecies found in West Virginia, *G. s. fuscus*, occurs in only seven counties in West Virginia (Grant, Greenbrier, Pendleton, Pocahontas, Randolph, Tucker, and Webster) and Highland County, Virginia. West Virginia locations for this species are in areas above 872 m (2,860 ft) in elevation.

Life History

Northern flying squirrels probably mate when one year old, although this has not been confirmed. The gestation period runs from 37 to 42 days. Females typically have one, or possibly two, litters of 1-6 young per year. The young are born blind and furless. The females nurse their young for approximately 2 months; the males have very little to do with rearing the young. Northern flying squirrels are active the entire year. Winter nests are usually in tree cavities and woodpecker holes or dense branches in the tops of evergreen trees; in summer the squirrels may also construct outside leaf nests which are often built in the upper portions of spruce trees. Nests are made up of several materials including finely shredded bark, moss, lichens, sedges, grasses, leaves, and other available materials.

Diet

Northern flying squirrels feed on a variety of foods including lichens, fungi (both epigeous fungi (fungi which fruit aboveground) and hypogeous fungi (fungi which fruit underground)), seeds, buds, fruits, staminate cones (male cones containing pollen such as the male cones of the red spruce), nuts, insects, and other plant and animal materials.

Bald Eagle *(Haliaeetus leucocephalus)*

Common Name
Bald Eagle

Scientific Name
Haliaeetus leucocephalus

Status
The Bald Eagle was "delisted" by the Service in July of 2007; however the species is still under protection of the Bald and Golden Eagle Protection Act of 1940.

West Virginia Status
The first documented bald eagle nest in West Virginia was discovered in 1981. Currently, the bald eagle is known to nest at eleven sites in the Mountain State. The nest sites are located in Grant, Hardy, Hampshire, Pendleton and Mineral counties. A nest was located in Wood County in 2001, but was abandoned before producing young. There are records of non-breeding eagles from most areas of the state.


(Photo by Craig Stihler)

Description
The image of the adult bald eagle is familiar to most Americans. Adult eagles have distinctive white heads making them appear bald; the tail feathers are likewise white. The body and wings of the adult bird are dark brown. The beak, eyes, and legs are yellow or golden, while the talons are black. Adult birds can reach a length of 0.76 meters (30 inches) with a wingspan approaching 2.1 meters (7 feet). Female eagles weigh 4.5 to 6.4 kilograms (10 to 14 pounds) and are usually larger than males which usually weigh 3.6 to 4.1 kilograms (8 to 9 pounds). Juvenile bald eagles lack the white heads and tails characteristic of adults, and can be confused with golden eagles. Their plumage is brown or mottled brown and white throughout. They can be distinguished from the comparably sized golden eagle by their bare lower legs; these are heavily feathered on golden eagles. Immature birds have darker beaks and eyes than adults. Their plumage gradually becomes lighter until the birds reach their fourth or fifth year when they take on the appearance of adults. Young eagles have long wing and tail feathers making them appear larger than the heavier adults.

Habitat
Bald eagles usually nest in large trees near large streams or lakes. Its migration routes follow river systems or mountain ranges which run in a general north-south direction. The bald eagle often winters along large interior or coastal bodies of water that remain free of ice. Except during migration, bald eagles are seldom found far from water

Threats And Prospects
The bald eagle was first protected under the "Bald Eagle Act," a largely symbolic piece of legislation, which was passed in 1940. The eagle had previously been shot by sportsmen and ranchers who feared losses of young lambs and calves to these large raptors (birds of prey). The loss of wetlands for farming and development was also a problem for the eagle which relied on such habitats for food. By the mid 1900's eagle numbers were perilously low throughout most of the lower 48 states. The use of the pesticide DDT was perhaps the most severe culprit in the decline of the eagle. Before it was banned in the early 1970's, DDT in the food chain caused a dramatic decline in the reproduction of eagles and other birds of prey. DDT was found to cause female birds to lay eggs with thin shells which were crushed by the weight of the adults trying to incubate them. Since DDT was banned in the United States, bald eagle populations in this country have generally been on the upswing. Population increases, coupled with the implementation of measures to protect eagle nest sites under the Endangered

Species Act, have led to the delisting of the species. Problems still persist for the bald eagle. Habitat loss still threatens eagles in many areas, and pollution of our rivers and lakes can impact eagles which feed on contaminated fish. The inadvertent shooting of misidentified eagles as well as poaching continues to plague eagle populations. The future of the bald eagle in the continental United States will depend on the extent to which current problems can be reduced. West Virginia can now claim more eagle nests than at any time in the past, and there is no reason to expect this trend not to continue if we protect this great bird and the habitats on which it depends.

Range

The bald eagle's breeding range has traditionally covered all of North America south of the arctic circle. Currently the northern subspecies breeds in Alaska and Canada while its southern counterpart inhabits most of the lower 48 states. The largest concentrations of southern bald eagles are centered around Florida, Maine, the Chesapeake Bay region, the Great Lakes region, and the Pacific Northwest.

Life History

When they are four or five years old eagles choose a mate, and the pair will often stay together for several years, perhaps for life. Nest preparation commences in the early spring, usually before a complete thaw has occurred (as early as February). Nests are built of sticks and twigs with an interior lining of moss or grass. Broods usually consist of two to three eggs, and both the male and female eagle incubate the eggs for a period of 21 to 46 days. The nestlings are quite helpless, relying on both parents for food and protection for most of the 10 to 13 weeks that they are in the nest. Eagles begin their southward migration as the ice begins to appear in the fall. They choose locations with open water and ample food for their winter home. Often conditions are difficult in the winter as many birds converge on an area with a limited food supply. At the first sign of moderating weather, the birds begin their northern migration, often returning to the nest they used the previous year. They repair and improve the nest by adding sticks and vegetation. Because they are always being refurbished, eagle nests can become very large.

Diet

Bald eagles feed primarily on fish, although small mammals, birds, and carrion can make up a substantial part of their diet. Eagles are opportunistic feeders, often relying on crows, ravens, and vultures to lead them to carcasses or injured prey.

Additional Comments

The bald eagle was designated our national symbol in 1782 over the objection of Benjamin Franklin who thought the bird was of "bad moral character." Franklin preferred the wild turkey.

Help

You can help the bald eagle by reporting eagle sightings, especially if a nest is suspected, to Eagle Sighting, West Virginia Division of Natural Resources, P. O. Box 67, Elkins, WV -- (304) 637-0245. If injured or dead eagles are encountered, report them immediately to your local conservation officer.

Spectaclecase *(Cumberlandia monodonta)*

Common Name
Spectaclecase

Scientific Name
Cumberlandia monodonta

A young and a mature spectacle case mussel.
Photo by USFWS; Nick Rowse

The spectaclecase is a freshwater mussel that the U.S. Fish and Wildlife Service has proposed to list as an endangered species.

Appearance
The spectaclecase is a large mussel that can grow to at least 9 inches in length. The shape of the shell is elongated, sometimes curved, and somewhat inflated (hence its name).

Range
Historically, the spectaclecase was found in at least 44 streams of the Mississippi, Ohio, and Missouri river basins in 15 states. Today, the spectaclecase has been extirpated from 4 states and is found in only 19 streams. Its current range includes Alabama, Arkansas, Illinois, Iowa, Kentucky, Minnesota, Missouri, Tennessee, Virginia, West Virginia, and Wisconsin. With few exceptions, spectaclecase populations are highly fragmented and restricted to short stream reaches.

Reproduction
The life cycle of most freshwater mussels is complex and includes a stage that is parasitic on fish or other host species. Initially, males release sperm into the water current. As female mussels siphon water for food and respiration, they also siphon sperm that fertilizes their eggs. Within special gill chambers, fertilized eggs develop into microscopic larvae called glochidia. Female mussels expel mature glochidia, which then must attach to the gills or fins of a specific species, usually a fish, to complete development into a juvenile mussel. If glochidia successfully attach to a host, they mature into juvenile mussels within a few weeks and then drop off. If they land in a suitable area, they continue to grow and mature. Using fish (or other aquatic species) as a host allows mussels to move upstream and populate habitats they could not otherwise reach. The host species for spectaclecase are unknown.

As a group, mussels are long-lived, with individuals living up to several decades, and possibly up to 100 to 200 years in extreme instances. The oldest documented spectaclecase was thought to be 70 years old.

Habitat
Spectaclecase mussels are found in large rivers where they live in areas sheltered from the main force of the current. This species is usually found in clusters in firm mud and in sheltered areas, such as beneath rock slabs, between boulders, and even under tree roots.

Feeding Habits
Adults are suspension-feeders, siphoning in water and feeding on the suspended algae, bacteria, detritus, microscopic animals, and dissolved organic material. Adult mussels spend their entire lives partially or completely buried within the substrate. The shell of a young spectaclecase mussel is smooth and solidly light yellow, tan, or brown, becoming rough and dark brown to black as the mussel ages.

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http://www.fws.gov/midwest/endangered January 2011

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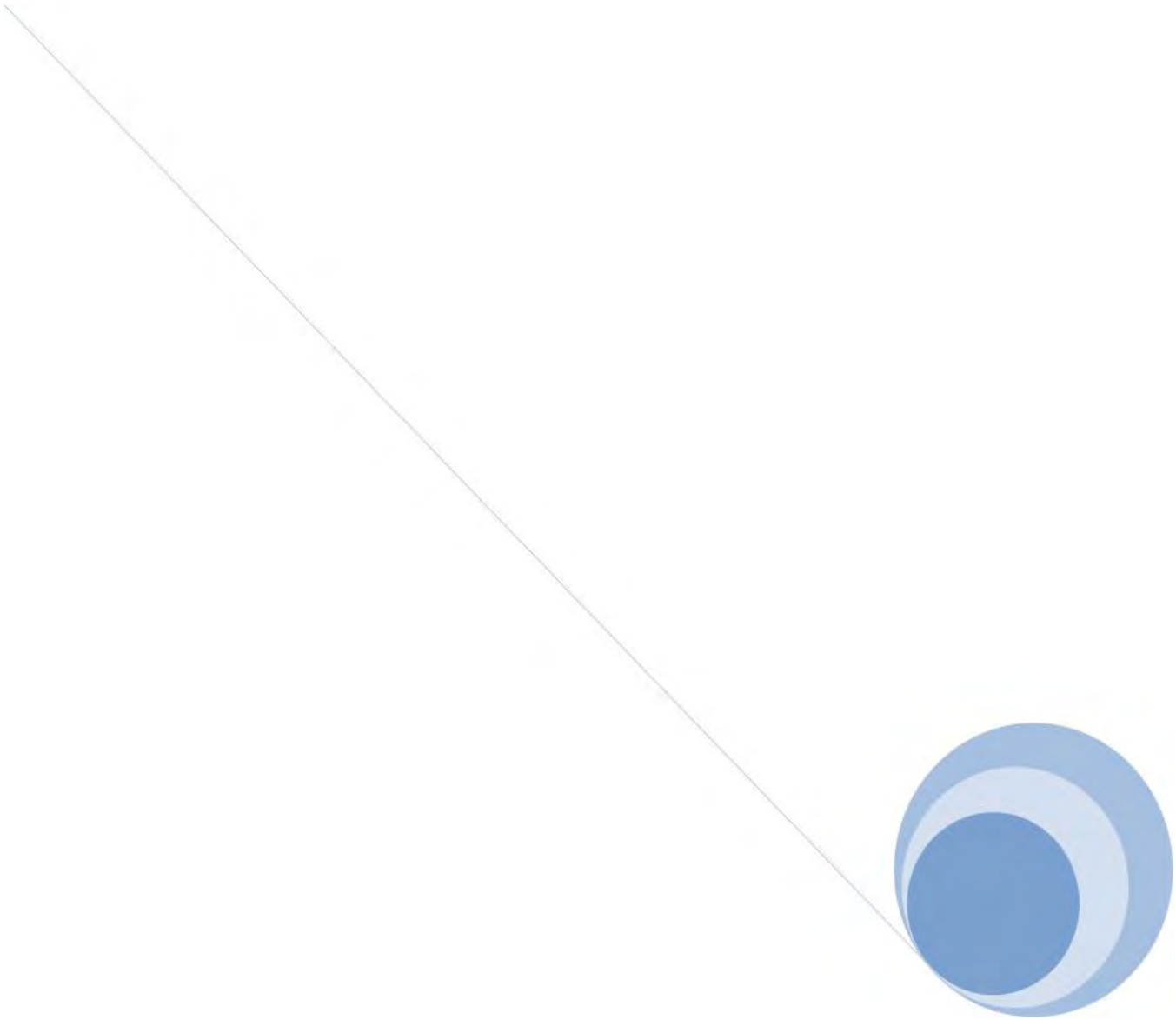

Tubercled-Blossom Pearly Mussel (*Epioblasma torulosa torulosa*)

Common Name
Tubercled-Blossom Pearly Mussel

Scientific Name
Epioblasma torulosa torulosa

Status
This mussel has been listed by the U.S. Fish and Wildlife Service as Endangered. This mussel was once quite abundant throughout all the major rivers of the eastern U.S. and southern Ontario. It was particularly numerous in the Ohio River Valley. Increased turbidity and siltation caused by deforestation, and the spread of intensive agriculture were major factors in the decline of this species. The last individual collected was a freshly dead one found below Kanawha Falls, West Virginia in 1969. There have been no specimens recovered since. The species may well be extinct.

Habitat
This mussel is found in large rivers, in shallow sand and gravel shoals with rapid currents.

Behavior
Reproduction requires a stable, undisturbed habitat and a sufficient population of host fish to complete the mussel's larval development. When the male discharges sperm into the current, females downstream siphon in the sperm in order to fertilize their eggs, which they store in their gill pouches until the larvae hatch. The females then expel the larvae. Those larvae that manage to attach themselves to the gills of a host fish grow into juveniles with shells of their own. At that point they detach from the host fish and settle into the streambed, ready for a long (possibly up to 50 years) life as an adult mussel.

Deforestation and intensive agriculture from the time of early settlement were dominant factors in the demise of many species of mussels. Other factors that are attributed to the decline of this mussel include the building of dams and reservoirs and pollution from agricultural and industrial runoff.

Feeding Habits
Adults are suspension-feeders, siphoning in water and feeding on the suspended algae, bacteria, detritus, microscopic animals, and dissolved organic material. Adult mussels spend their entire lives partially or completely buried within the substrate. The shell of a young spectaclecase mussel is smooth and solidly light yellow, tan, or brown, becoming rough and dark brown to black as the mussel ages.

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Sheepnose *(Plethobasus cyphyus)*

Common Name
Sheepnose

Scientific Name
Plethobasus cyphyus

These sheepnose mussels were collected during a survey conducted to determine presence and numbers of mussels in an Illinois river.
Photo by USFWS; Kristen Lundh

Status
The sheepnose is a freshwater mussel that the U.S. Fish and Wildlife Service has proposed to list as an endangered species.

The sheepnose mussel was designated by the U.S. Fish and Wildlife Service as a candidate species for listing as threatened or endangered under the Endangered Species Act. The Service is now proposing to list it as endangered. If listed, the sheepnose will receive the full protection of the Endangered Species Act, which provides protection against certain practices and would require planning for recovery.

Range
The sheepnose is found across the Midwest and Southeast. However, it has been eliminated from two-thirds of the total number of streams from which it was historically known (24 streams are currently occupied compared with 77 streams historically), and it has also been eliminated from hundreds of miles of rivers in the Illinois and Cumberland River basins, and from several reaches of the Mississippi and Tennessee Rivers. The sheepnose is currently found in Alabama, Illinois, Indiana, Iowa, Kentucky, Minnesota, Mississippi, Missouri, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, and Wisconsin.

Most populations of sheepnose are small and geographically isolated. These small populations, which live in short sections of rivers, are susceptible to extirpation from single catastrophic events, such as toxic spills. Also, isolation makes natural repopulation impossible without human assistance.

Appearance
The sheepnose is a medium-sized mussel that grows to about 5 inches in length. The shell is thick and solid, with the overall shape slightly longer than wide and somewhat inflated. The sheepnose shell is smooth, shiny, and light yellow to a dull yellowish brown and without lines or rays but with dark concentric ridges. The ridges result from periods when growth stops or slows.

Reproduction
The life cycle of the sheepnose, like most freshwater mussels, is complex and includes a stage that is parasitic on fish. Initially, males release sperm into the water current. As female mussels siphon water for food and respiration, they also siphon sperm that fertilizes their eggs. Within special gill chambers, fertilized eggs develop into microscopic larvae called glochidia. Female mussels expel the mature glochidia, which then must attach to gills or fins of a specific host fish species to complete development into a juvenile mussel.

Sheepnose expel glochidia in conglutinates, a jellylike mass of mucus and glochidia, that mimic fish food in appearance. These conglutinates are narrow, red or pink, and discharged in unbroken form so that they look like small worms. When a fish eats a conglutinate, glochidia are exposed to and can attach to the fish's gills.

If glochidia successfully attach to a host fish, they mature into juvenile mussels within a few weeks and

then drop off. The sauger (*Stizostedion canadense*) is the sheepnose mussel's only known host, but others may be available. After dropping off, glochidia continue to grow and mature if they land in suitable areas. Using fish as hosts allows the sheepnose to move upstream and populate habitats it could otherwise not reach.

As a group, mussels are long-lived, with individuals living up to several decades, and possibly up to 100, and even 200 years. Sheepnose, especially thick-shelled individuals from large rivers, are thought to live longer than other mussel species, however, we have no age information.

Habitat
Sheepnose mussels live in larger rivers and streams where they are usually found in shallow areas with moderate to swift currents flowing over coarse sand and gravel. Sheepnose have also been found in mud, cobble, and boulders. In larger rivers they may be found in deep runs.

Feeding Habits
Adults are suspension-feeders, siphoning in water and feeding on the suspended algae, bacteria, detritus, microscopic animals, and dissolved organic material. Adult mussels spend their entire lives partially or completely buried within the substrate.

Dams
Dams affect both upstream and downstream mussel populations by disrupting natural river flow patterns, scouring river bottoms, changing water temperatures, and eliminating habitat. Large rivers throughout most of the sheepnose mussel's range have been impounded; leaving short, isolated patches of habitat below dams.

The sheepnose also depends on host fish to move upstream. Because dams block fish passage, mussels are also prevented from moving upstream, which isolates upstream from downstream populations, leading to small, unstable populations, which are more likely to die out.

Sedimentation
Poor land use practices, dredging, intensive timber harvests, road construction, and other activities may accelerate erosion and increase sedimentation. Sedimentation that results in blanketing a river bottom may suffocate mussels because they cannot move fast enough to avoid the impact. Also, increased sedimentation reduces the ability of mussels to remove food and oxygen from the water, which can lead to decreased growth, reproduction, and survival.

Pollution
Adult mussels are easily harmed by toxins and degraded water quality from pollution because they are sedentary (they tend to stay in one place). Pollution may come from specific, identifiable sources such as accidental spills, factory discharges, sewage treatment plants, and solid waste disposal sites. Pollution also comes from diffuse sources like runoff from fields, feedlots, mines, construction sites, private wastewater discharges, and roads. Contaminants may directly kill mussels, but they may also indirectly harm sheepnose by reducing water quality, which reduces survival and reproduction, and lowers the numbers of host fish.

Channelization
Dredging and channelization have profoundly changed rivers nationwide. Channelization physically alters rivers by accelerating erosion, reducing depths, decreasing habitat diversity, destabilizing stream bottoms, and removing riparian vegetation.

Nonnative Species
The invasion of the nonnative zebra mussel into the United States poses a serious threat. Zebra mussels proliferate to such an extent that they deplete food resources and they attach to native mussel shells in such large numbers that the native mussel cannot open its shell to eat or breathe.

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January 2011

Golden-winged Warbler *(Vermivora chrysoptera)*

Common Name
Golden-winged Warbler

Scientific Name
Vermivora chrysoptera

Status
Partners in Flight lists the golden-winged warbler as a high priority species of concern.

West Virginia Status
The golden-winged warbler is a relatively uncommon species in West Virginia. The Breeding Bird Atlas Project reported it from 40 counties within the state usually in small scattered patches of suitable habitat.

Description
The golden-winged warbler is a small neotropical migrant warbler 9.5 - 11.5 cm (4 - 4.5 inches) in length. It has a slate gray back, wings, and tail and a white to light gray underside with a bright yellow forehead and wing patch. This species has a distinct black facial pattern similar to that of the chickadees. The feet and legs of this bird are dark brown and the bill is relatively long and sharply pointed. The golden-winged warbler's bill color changes seasonally from black in the spring to pale brown in the fall. There is little seasonal variation in plumage and also little difference between the plumage of the males and females.

Range
The breeding range of the golden-winged warbler extends from southern Manitoba east across much of Minnesota, Wisconsin, Michigan, southern Ontario and Quebec to New York, Vermont, Massachusetts, and Connecticut. Its range then extends southward along the Appalachian Mountains through Pennsylvania, western Maryland, West Virginia, Virginia, North Carolina, Tennessee, and into northern Georgia. The golden-winged warbler breeds in the middle to higher elevations of the central, southern, and eastern portions of West Virginia, but it is absent from the western lowland portions of the state and rare in the Eastern Panhandle. The wintering range for the golden-winged warbler extends from southern Mexico south through Central America to the northern portions of South America.

Habitat
The golden-winged warbler requires brushy early successional habitat. It prefers to nest in areas such as power line rights-of-way, shrubby fields, abandoned strip mines, alder swamps, beaver created wetlands, and abandoned orchards.

Diet
Insects comprise the majority of this species' diet. Some of the food items taken include spiders, caterpillars, moths and their larvae, and a variety of flying insects. The golden-winged warbler forages by gleaning insects from twigs and dead leaves, often hanging upside down much like a chickadee.

Life History
In early April the golden-winged warbler leaves its wintering grounds in Mexico and Central America and begins its migration north. It generally arrives in West Virginia during the last week of April. The female builds a small cup-shaped nest from dead leaves, grasses, and tree bark. The nest is located on or just above the ground and is generally concealed

by clumps of grass or located at the base of a tree. Four to five white eggs with brown blotches are laid and incubated by the female for 10-11 days. Both the male and the female golden-wingeds care for the young after hatching, and the young usually fledge within 10 days. Both parents may care for the young birds for up to a month after fledging. Most golden-winged warblers have left West Virginia by the end of August to migrate back to their wintering grounds.

Threats and Prospects

The golden-winged warbler faces two major threats in West Virginia and throughout much of its range. First, because this species requires such a specific habitat, the early successional stages of plant growth, optimal habitat tends to be widely scattered and in small patches. Also, once a disturbance has occurred (i.e., clearcut, land clearing, or flooding resulting from beaver activity) this optimal early successional habitat may be available for as little as 4 or 5 years before it is too brushy for golden-winged presence. In essence, the golden-winged warblers range is constantly changing as a result of land use patterns and forest succession.

The second major threat affecting the golden-winged warbler is the displacement by and hybridization with the closely related and more dominant blue-winged warbler (*Vermivora pinus*). Blue-winged warblers tend to tolerate a later successional stage of plant growth. Once a patch of habitat becomes too "grown-up" for golden-wingeds, blue-wingeds tend to move in and take over displacing the golden-wingeds. The range of the blue-winged warbler has also shifted north resulting in areas of overlap with the range of the golden-winged warbler. These areas of overlap often result in the hybridization of the two species. Depending upon the degree of hybridization one of two hybrid forms may occur, the Brewster's warbler or the Lawrence's warbler. These hybrid offspring in turn breed with pure golden-wingeds, blue-wingeds, or less often, other hybrids and as a result the area eventually becomes totally inhabited by the more dominant blue-winged warblers.

What you can do to help

If you observe golden-winged warblers, blue-winged warblers, or either of the two hybrid forms during the breeding season, record the location, the general habitat type and the prominent species of vegetation. This information can be reported to the WVDNR Wildlife Diversity Program at (304)-637-0245 or write Golden-winged Warbler Report, P.O. Box 67, Elkins, WV 26241.

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NRCS Natural Resources Conservation Service