USGS Cooperative Fish and Wildlife Research Units

AREAS OF EXPERTISE

Cooperative Fish and Wildlife Research Units

September 2015

U.S. Geological Survey
Ecosystems Mission Area
Anne E. Kinsinger, Associate Director
# Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>3</td>
</tr>
<tr>
<td><strong>USGS Mission Area Focal Areas</strong></td>
<td>4</td>
</tr>
<tr>
<td>Emerging Diseases and Biosecurity</td>
<td>4</td>
</tr>
<tr>
<td>Invasive Species</td>
<td>5</td>
</tr>
<tr>
<td>Advanced Technologies</td>
<td>6</td>
</tr>
<tr>
<td>Landscape Science</td>
<td>7</td>
</tr>
<tr>
<td>Energy and Wildlife</td>
<td>8</td>
</tr>
<tr>
<td>Ecosystem Services</td>
<td>9</td>
</tr>
<tr>
<td>Ecological Flows</td>
<td>10</td>
</tr>
<tr>
<td><strong>Thematic Areas of Expertise</strong></td>
<td>11</td>
</tr>
<tr>
<td>Adaptive Management</td>
<td>11</td>
</tr>
<tr>
<td>Climate Science</td>
<td>12</td>
</tr>
<tr>
<td>Conservation Genetics and Genomics</td>
<td>13</td>
</tr>
<tr>
<td>Ecological Stressors</td>
<td>14</td>
</tr>
<tr>
<td>Ecosystem Ecology</td>
<td>15</td>
</tr>
<tr>
<td>Ecotoxicology</td>
<td>16</td>
</tr>
<tr>
<td>Fish and Wildlife Health</td>
<td>17</td>
</tr>
<tr>
<td>Habitat and Population Monitoring</td>
<td>18</td>
</tr>
<tr>
<td>Harvest Management</td>
<td>19</td>
</tr>
<tr>
<td>Human Dimensions</td>
<td>20</td>
</tr>
<tr>
<td>Imperiled Species</td>
<td>21</td>
</tr>
<tr>
<td>Landscape Ecology</td>
<td>22</td>
</tr>
<tr>
<td>Marine Ecology</td>
<td>23</td>
</tr>
<tr>
<td>Population Dynamics, Demography, and Modeling</td>
<td>24</td>
</tr>
<tr>
<td>Quantitative Science</td>
<td>25</td>
</tr>
<tr>
<td>Restoration Ecology</td>
<td>26</td>
</tr>
<tr>
<td>Spatial Ecology</td>
<td>27</td>
</tr>
<tr>
<td>Species of Management Concern</td>
<td>28</td>
</tr>
<tr>
<td>Structured Decision Making</td>
<td>29</td>
</tr>
<tr>
<td>Urban Fish and Wildlife Ecology</td>
<td>30</td>
</tr>
<tr>
<td>Wetland Science</td>
<td>31</td>
</tr>
<tr>
<td><strong>Glossary</strong></td>
<td>32</td>
</tr>
<tr>
<td><strong>Contact Information for Unit Scientists</strong></td>
<td>34</td>
</tr>
<tr>
<td><strong>Senior Headquarters Unit Staff Directory</strong></td>
<td>38</td>
</tr>
</tbody>
</table>
Introduction

The Cooperative Fish and Wildlife Research Units were established in 1935 as a collaborative effort among the federal government, state governments, land grant universities, and the Wildlife Management Institute. Currently there are 40 Units in 38 states assigned a mission to (1) deliver actionable science to cooperating agencies and organizations; (2) develop the workforce of the future through applied graduate education; and (3) fulfill the training and technical assistance needs of cooperators. Each Unit is staffed by federal scientists employed by the U.S. Geological Survey, Ecosystems Mission Area, Cooperative Fish and Wildlife Research Unit Program. They receive support from, and work closely with their respective state fish and wildlife agency. The Units also work with the U.S. Fish and Wildlife Service and other agencies and organizations to assist them with their science, education, and workforce development needs. Unit scientists are embedded in the graduate faculty of state land grant universities, and receive graduate faculty appointments, office and laboratory space, and administrative support from the universities. The research agenda for each Unit is approved by the Unit’s Coordinating Committee, comprised of representatives from the U.S. Geological Survey, the state fish and wildlife agency, the university, the Wildlife Management Institute, and the U.S. Fish and Wildlife Service.

The purpose of this document is to provide an overview of the thematic science expertise of the Unit system as a whole. This can be used to assist in planning transboundary, multi-state landscape scale research, assist cooperators in finding particular experts to help meet science needs, and potentially for workforce planning. It can also assist in development of Unit-wide networks of expertise, where unit scientists can share information and collaborate on science endeavors. The document begins with focal thematic science areas of interest to the U.S. Geological Survey Ecosystems Mission Area (ECO). In addition to the 40 Units, ECO is comprised of 17 major research science centers, each with satellite field stations networked across the nation. Collectively, the Units and science centers contribute to these focal science themes, and this document may assist in fostering collaborations.

Thematic areas of expertise follow, representing priority science themes derived from planning documents developed by the Association of Fish and Wildlife Agencies, the U.S. Fish and Wildlife Service, and the U.S. Geological Survey. A glossary is provided that describes many of these themes.

Each science theme contains a list of Unit scientists who have expertise in that particular science thrust. A map for each theme provides a spatial view of the distribution of Units with that expertise (states highlighted in blue, with stars indicating if more than one Unit in a state that has separate fishery and wildlife Units has expertise). Contact information is provided alphabetically for each Unit scientist at the end of the document, with email and phone contact, as well as a link to each scientist’s web page so the reader can learn more about a given scientist’s ongoing and past research.
USGS Ecosystems Mission Area Focal Areas

**Emerging Diseases and Biosecurity**

Mevin Hooten, CO CRU  
Christine Moffitt, ID CRU  
W. David Walter, PA CRU  
W. Mark Ford, VA CRU  
Michael Samuel, WI Wildlife CRU
Invasive Species

Mark Wipfli, AK CRU
Scott Bonar, AZ CRU
Melanie Culver, AZ CRU
Daniel Magoullick, AR CRU
Dana Winkelman, CO CRU
Brian Irwin, GA CRU
Clint Moore, GA CRU
Michael Quist, ID CRU
Christine Moffitt, ID CRU
Clay Pierce, IA CRU
David Fulton, MN CRU
Alexander Zale, MT Fish CRU
Chris Guy, MT Fish CRU
Craig Allen, NE CRU
Kevin Pope, NE CRU
Colleen Caldwell, NM CRU
Tom Kwak, NC CRU
Jim Long, OK CRU
Katie Dugger, OR CRU
Steve Chipps, SD CRU
Phillip Bettoli, TN CRU
Reynaldo Patino, TX CRU
Phaedra Budy, UT CRU
Donna Parrish, VT CRU
Paul Angermeier, VA CRU
David Beauchamp, WA CRU
Stuart Welsh, WV CRU
Daniel Isermann, WI Fish CRU
Anna Chalfoun, WY CRU
## Advanced Technologies

<table>
<thead>
<tr>
<th>Name</th>
<th>CRU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barry Grand</td>
<td>AL CRU</td>
</tr>
<tr>
<td>Scot Bonar</td>
<td>AZ CRU</td>
</tr>
<tr>
<td>Dana Winkelman</td>
<td>CO CRU</td>
</tr>
<tr>
<td>Mevin Hooten</td>
<td>CO CRU</td>
</tr>
<tr>
<td>William Kendall</td>
<td>CO CRU</td>
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<tr>
<td>Raymond Carthy</td>
<td>FL CRU</td>
</tr>
<tr>
<td>Clint Moore</td>
<td>GA CRU</td>
</tr>
<tr>
<td>Michael Quist</td>
<td>ID CRU</td>
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<tr>
<td>Joseph Zydlewski</td>
<td>ME CRU</td>
</tr>
<tr>
<td>David Fulton</td>
<td>MN CRU</td>
</tr>
<tr>
<td>Craig Allen</td>
<td>NE CRU</td>
</tr>
<tr>
<td>Scott Carleton</td>
<td>NM CRU</td>
</tr>
<tr>
<td>Carl Schreck</td>
<td>OR CRU</td>
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<tr>
<td>Duane Diefenbach</td>
<td>PA CRU</td>
</tr>
<tr>
<td>W. David Walter</td>
<td>PA CRU</td>
</tr>
<tr>
<td>Tim Grabowski</td>
<td>TX CRU</td>
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<tr>
<td>Thomas Edwards</td>
<td>UT CRU</td>
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<tr>
<td>Therese Donovan</td>
<td>VT CRU</td>
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<tr>
<td>W. Mark Ford</td>
<td>VA CRU</td>
</tr>
<tr>
<td>David Beauchamp</td>
<td>WA CRU</td>
</tr>
<tr>
<td>Stuart Welsh</td>
<td>WV CRU</td>
</tr>
</tbody>
</table>
Energy and Wildlife
Brad Griffith, AK CRU
Joseph Zydlewski, ME CRU
Stephen DeStefano, MA CRU
Alexander Zale, MT Fish CRU
Christopher Guy, MT Fish CRU
Scott Carleton, NM CRU
Steve Chipps, SD CRU
Clint Boal, TX CRU
W. Mark Ford, VA CRU
Paul Angermeier, VA CRU
Petra Wood, WV CRU
Christine Ribic, WI Wildlife CRU
Matthew Kauffman, WY CRU
Annika Walters, WY CRU
Anna Chalfoun, WY CRU
Ecosystem Services
Brad Griffith, AK CRU
A. David McGuire, AK CRU
Mark Wipfli, AK CRU
Christine Moffitt, ID CRU
Megan LaPeyre, LA CRU
Joseph Zydlewski, ME CRU
Harold Schramm, MS CRU
Chris Guy, MT Fish CRU
Craig Allen, NE CRU
Kevin Pope, NE CRU
Angela Fuller, NY CRU
Steve Chipps, SD CRU
Phaedra Budy, UT CRU
Paul Angermeier, VA CRU
Christine Ribic, WI Wildlife CRU
Ecological Flows
Elise Irwin, AL CRU
Jeff Falke, AK CRU
Mark Wipfli, AK CRU
A. David McGuire, AK CRU
Scott Bonar, AZ CRU
Daniel Magoullick, AR CRU
Margaret Wilzbach, CA CRU
Dana Winkelman, CO CRU
Brian Irwin, GA CRU
Clay Pierce, IA CRU
Cynthia Loftin, ME CRU
Joseph Zydlewski, ME CRU
Allison Roy, MA CRU
Craig Paukert, MO CRU
Amanda Rosenberger, MO CRU
Alexander Zale, MT Fish CRU
Kevin Pope, NE CRU
Joseph (TJ) Fontaine, NE CRU
Shannon Brewer, OK CRU
Carl Schreck, OR CRU
James Peterson, OR CRU
Tyler Wagner, PA CRU
Steven Chipps, SD CRU
Tim Grabowski, TX CRU
Phaedra Budy, UT CRU
Donna Parrish, VT CRU
Paul Angermeier, VA CRU
David Beauchamp, WA CRU
Stuart Welsh, WV CRU
Thematic Areas of Expertise

Adaptive Management
Barry Grand, AL CRU
Conor McGowan, AL CRU
Elise Irwin, AL CRU
William Kendall, CO CRU
Clint Moore, GA CRU
Brian Irwin, GA CRU
Megan LaPeyre, LA CRU
Mike Mitchell, MT Wildlife CRU
Craig Allen, NE CRU
Joseph (TJ) Fontaine, NE CRU
Angela Fuller, NY CRU
James Peterson, OR CRU
Duane Diefenbach, PA CRU
Tyler Wagner, PA CRU
Clint Boal, TX CRU
Therese Donovan, VT CRU
Climate Science
Brad Griffith, AK CRU
A. David McGuire, AK CRU
Dana Winkelman, CO CRU
Stephen DeStefano, MA CRU
Allison Roy, MA CRU
Craig Paukert, MO CRU
Craig Allen, NE CRU
Joseph (TJ) Fontaine, NE CRU
Colleen Caldwell, NM CRU
James Cain, NM CRU
Angela Fuller, NY CRU
James Peterson, OR CRU
Steve Chipps, SD CRU
Reynaldo Patino, TX CRU
Phaedra Budy, UT CRU
W. Mark Ford, VA CRU
Paul Angermeier, VA CRU
Dave Beauchamp, WA CRU
Chistine Ribic, WI Wildlife CRU
Michael Samuel, WI Wildlife CRU
Matthew Kauffman, WY CRU
Conservation Genetics and Genomics
Melanie Culver, AZ CRU
Mevin Hooten, CO CRU
David Leslie, OK CRU
W. David Walter, PA CRU
Michael Samuel, WI Wildlife CRU
Ecological Stressors
Brad Griffith, AK CRU
Jeff Falke, AK CRU
A. David McGuire, AK CRU
Scott Bonar, AZ CRU
Daniel Magoullick, AR CRU
Dana Winkelman, CO CRU
Abby Powell, FL CRU
Brian Irwin, GA CRU
Clay Pierce, IA CRU
Michael Quist, ID CRU
Christine Moffitt, ID CRU
Cynthia Loftin, ME CRU
Stephen DeStefano, MA CRU
Allison Roy, MA CRU
Amanda Rosenberger, MO CRU
Alexander Zale, MT Fish CRU
Craig Allen, NE CRU
Colleen Caldwell, NM CRU
Scott Carleton, NM CRU

Thomas Kwak, NC CRU
Carl Schreck, OR CRU
Daniel Roby, OR CRU
Katie Dugger, OR CRU
Tyler Wagner, PA CRU
Steven Chipps, SD CRU
Reynaldo Patino, TX CRU
Tim Grabowski, TX CRU
Clint Boal, TX CRU
W. Mark Ford, VA CRU
Paul Angermeier, VA CRU
David Beauchamp, WA CRU
Petra Wood, WV CRU
Christine Ribic, WI Wildlife CRU
Michael Samuel, WI Wildlife CRU
Matthew Kauffman, WY CRU
Annika Walters, WY CRU
Anna Chalfoun, WY CRU
Ecosystem Ecology
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A. David McGuire, AK CRU
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Daniel Magoulick, AR CRU
Dana Winkelman, CO CRU
Clay Pierce, IA CRU
David Haukos, KS CRU
Sammy King, LA CRU
Cynthia Loftin, ME CRU
Joseph Zydlewski, ME CRU
Harold Schramm, MS CRU
Amanda Rosenberger, MO CRU
Elisabeth Webb, MO CRU
Thomas Martin, MT Wildlife CRU
Craig Allen, NE CRU
Kevin Pope, NE CRU
Joseph (TJ) Fontaine, NE CRU
W. David Walter, PA CRU
Tyler Wagner, PA CRU
Steve Chipps, SD CRU
Joshua Stafford, SD CRU
Clint Boal, TX CRU
W. Mark Ford, VA CRU
Paul Angermeier, VA CRU
Christine Ribic, WI Wildlife CRU
Michael Samuel, WI Wildlife CRU
Petra Wood, WV CRU
Matthew Kauffman, WY CRU
Annika Walters, WY CRU
Anna Chalfoun, WY CRU
Ecotoxicology
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Cecil Jennings, GA CRU
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Martha Mather, KS CRU
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David Andersen, MN CRU
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Christopher Guy, MT Fish CRU
Michael Mitchell, MT Wildlife CRU
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Kevin Pope, NE CRU
Colleen Caldwell, NM CRU
Scott Carleton, NM CRU
James Cain, NM CRU
Angela Fuller, NY CRU
Theodore Simons, NC CRU
David Leslie, OK CRU
Jim Long, OK CRU
Daniel Roby, OR CRU
James Peterson, OR CRU
Katie Dugger, OR CRU
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Steve Chipps, SD CRU
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Stuart Welsh, WV CRU
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Christine Ribic, WI Wildlife CRU
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Annika Walters, WY CRU
Anna Chalfoun, WY CRU
Harvest Management
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Robert Klawer, IA CRU
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Matthew Kauffman, WY CRU
Human Dimensions
David Fulton, MN CRU
Larry Gigliotti, SD CRU
Stephen DeStefano, MA CRU
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Tim Grabowski, TX CRU
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Thomas Edwards, UT CRU
Donna Parrish, VT CRU
W. Mark Ford, VA CRU
Paul Angermeier, VA CRU
Petra Wood, WV CRU
Stuart Welsh, WV CRU
Christine Ribic, WI Wildlife CRU
Anna Chalfoun, WY CRU
Landscape Ecology

Barry Grand, AL CRU
Elise Irwin, AL CRU
Brad Griffith, AK CRU
Jeff Falke, AK CRU
A. David McGuire, AK CRU
Mark Wipfli, AK CRU
Melanie Culver, AZ CRU
Daniel Magoullick, AR CRU
Mevin Hooten, CO CRU
Robert Klaver, IA CRU
Cynthia Loftin, ME CRU
David Fulton, MN CRU
Craig Paukert, MO CRU
Amanda Rosenberger, MO CRU
Elisabeth Webb, MO CRU

Craig Allen, NE CRU
Scott Carleton, NM CRU
Jaime Collazo, NC CRU
Shannon Brewer, OK CRU
Tyler Wagner, PA CRU
Joshua Stafford, SD CRU
Thomas Edwards, UT CRU
Therese Donovan, VT CRU
W. Mark Ford, VA CRU
Paul Angermeier, VA CRU
Christine Ribic, WI Wildlife CRU
Matthew Kauffman, WY CRU
Annika Walters, WY CRU
Anna Chalfoun, WY CRU
Population Dynamics, Demography and Modeling

Barry Grand, AL CRU
Conor McGowan, AL CRU
Dana Winkelman, CO CRU
Bill Kendall, CO CRU
Abby Powell, FL CRU
Brian Irwin, GA CRU
Clint Moore, GA CRU
Courtney Conway, ID CRU
Michael Quist, ID CRU
Clay Pierce, IA CRU
David Haukos, KS CRU
Megan LaPeyre, LA CRU
Joseph Zydlewski, ME CRU
Stephen DeStefano, MA CRU
Allison Roy, MA CRU
David Andersen, MN CRU
Amanda Rosenberger, MO CRU
Christopher Guy, MT Fish CRU

Mike Mitchell, MT Wildlife CRU
Kevin Pope, NE CRU
James Cain, NM CRU
Scott Carleton, NM CRU
Angela Fuller, NY CRU
Jim Long, OK CRU
James Peterson, OR CRU
Katie Dugger, OR CRU
Duane Diefenbach, PA CRU
Tim Grabowski, TX CRU
Clint Boal, TX CRU
Phaedra Budy, UT CRU
W. Mark Ford, VA CRU
Paul Angermeier, VA CRU
Daniel Isermann, WI Fish CRU
Christine Ribic, WI Wildlife CRU
Michael Samuel, WI Wildlife CRU
Matthew Kauffman, WY CRU
Quantitative Science
Bill Kendall, CO CRU
Mevin Hooten, CO CRU
Clint Moore, GA CRU
Brian Irwin, GA CRU
James Peterson, OR CRU
Duane Diefenbach, PA CRU
Thomas Edwards, UT CRU
Therese Donovan, VT CRU
Christine Ribic, WI Wildlife CRU
Michael Samuel, WI Wildlife CRU
Restoration Ecology
Elise Irwin, AL CRU
David Krementz, AR CRU
Margaret Wilzbach, CA CRU
Sammy King, LA CRU
Megan LaPeyre, LA CRU
Joseph Zydlewski, ME CRU
Allison Roy, MA CRU
David Fulton, MN CRU
Alexander Zale, MT Fish CRU
Scott Carleton, NM CRU
Daniel Roby, OR CRU
Phaedra Budy, UT CRU
W. Mark Ford, VA CRU
Spatial Ecology
Brad Griffith, AK CRU
Jeff Falke, AK CRU
A. David McGuire, AK CRU
Mevin Hooten, CO CRU
Cynthia Loftin, ME CRU
Stephen DeStefano, MA CRU
Mike Mitchell, MT Wildlife CRU
Joseph (TJ) Fontaine, NE CRU
Jim Long, OK CRU
W. David Walter, PA CRU
Thomas Edwards, UT CRU
W. Mark Ford, VA CRU
Paul Angermeier, VA CRU
Christine Ribic, WI Wildlife CRU
Matthew Kauffman, WY CRU
Species of Management Concern

Barry Grand, AL CRU
Elise Irwin, AL CRU
Scott Bonar, AZ CRU
Melanie Culver, AZ CRU
Dana Winkleman, CO CRU
William Kendall, CO CRU
Abby Powell, FL CRU
Raymond Carthy, FL CRU
Brian Irwin, GA CRU
Clint Moore, GA CRU
Christine Moffitt, ID CRU
Michael Quist, ID CRU
Robert Klaiver, IA CRU
Clay Pierce, IA CRU
David Haukos, KS CRU
Sammy King, LA CRU
Cynthia Loftin, ME CRU
Stephen DeStefano, MA CRU
David Andersen, MN CRU
David Fulton, MN CRU
Alexander Zale, MT Fish CRU
Chris Guy, MT Fish CRU
Mike Mitchell, MT Wildlife CRU
Joseph Fontaine, NE CRU
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James Cain, NM CRU
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Tyler Wagner, PA CRU
Patrick Jodice, SC CRU
Steve Chipps, SD CRU
Joshua Stafford, SD CRU
Phillip Bettoli, TN CRU
Tim Grabowski, TX CRU
Clint Boal, TX CRU
Phaedra Budy, UT CRU
Donna Parrish, VT CRU
Therese Donovan, VT CRU
W. Mark Ford, VA CRU
Paul Angermeier, VA CRU
Petra Wood, WV CRU
Stuart Welsh, WV CRU
Daniel Isermann, WI Fish CRU
Christine Ribic, WI Wildlife CRU
Michael Samuel, WI Wildlife CRU
Annika Walters, WY CRU
Anna Chalfoun, WY CRU
Structured Decision Making
Barry Grand, AL CRU
Conor McGowan, AL CRU
Elise Irwin, AL CRU
William Kendall, CO CRU
Brian Irwin, GA CRU
Clint Moore, GA CRU
Mike Mitchell, MT Wildlife CRU
Angela Fuller, NY CRU
James Peterson, OR CRU
Clint Boal, TX CRU
**Glossary**

**Advanced Tools/Technology**
Advanced Tools / Technology Development includes development and adaptation of new technologies and tools that increase effectiveness, efficiency, safety, accuracy, geographic extent, or timeliness of data gathering, dissemination, analysis, and interpretation of natural resource phenomena. It also includes development of new tools that assist natural resource managers in decision-making and adaptive management. Once these tools/technologies are developed and tested, projects using them would be listed under one of the other lines of work.

**Ecological Stressors**
Ecological Stressors includes the study of the physical, chemical, and biological factors that impact the health and integrity of ecosystems and productivity of species, often changing the trajectories of species and ecosystems. These stressors can include natural environmental or anthropogenic factors (e.g., fire, climate change, energy development, storms). For purposes of this exercise, research into the effects of a stressor on an imperiled species or species of management concern should be included under the Imperiled Species and Species of Management Concern lines of work, respectively. Similarly, research into the effects of fish and wildlife diseases should be included in the Fish and Wildlife Health line of work.

**Ecosystem Ecology**
Ecosystem Ecology includes the integrated study of biotic and abiotic components in the environment including processes (e.g. energy flow, materials cycling, competition, predation, habitat selection) and their interaction within an ecosystem framework. Projects could examine how ecosystems work and how processes relate to the chemical, geological, agronomical, hydrological, and biological elements in the environment. With humans as a dominant element of many ecosystems, human impacts and benefits (e.g. ecosystem services) could be addressed. Work may be related to a given kind of environment, such as aquatic systems, deserts, forests, and so forth. Work may also be related to a given species, population, or taxon (e.g. mammals) but would account for ecological relationships within the environments as a whole. While the science may have application for restoration (Restoration Science) or be of some relevance in a particular landscape scale program (Landscape Science), the primary thrust of the work classified here should be consideration of ecosystem components and how they dynamically interact.

**Ecosystem Services**
An ecosystem service is any positive benefit provided to society by fish, wildlife, or components of ecosystems through their functions.

**Imperiled Species**
Imperiled Species is the study of species and their habitats that are declining, rare, or uncommon; it includes species that are federally listed as threatened or endangered or identified as candidates for future listing consideration. It also includes the assessment of threats and the development of management tools to aid species recovery and monitoring.
**Invasive Species**

Invasive Species is the study of non-indigenous species that can adversely affect the habitats they invade environmentally, ecologically, and/or economically. It considers how invasive species can displace native species and their ability to dominate or alter an ecosystem, or enter an ecosystem beyond its natural range and cause economic or environmental harm. It can also include basic biology about invading species to determine potential spread and to develop control techniques.

**Landscape Science**

Landscape Science is the holistic study of the origin, structure, and dynamics of ecosystem components across broad geographic or watershed scales. It includes analysis of spatial and temporal information, effects of ecosystem stressors, and how such information can be scaled to address specific management needs and support decision-making at broad geographic scales. This category generally includes research on largely defined landscapes, such as the Chesapeake Bay, Everglades, Great Basin, and Great Lakes. It could also include landscape scale assessments and programs, such as the Wyoming Landscape Conservation Initiative and development of Rapid Ecoregional Assessments.

**Restoration Science**

Restoration Science is the research in support of the practice of ecological restoration and rehabilitation. It is the study of the traditional and developing practices of renewing, restoring, and adaptively managing degraded, damaged, or destroyed ecosystems through human intervention and action to re-establish ecosystem functions and services. It can include design of monitoring strategies and assessment of the effectiveness of restoration actions in support of adaptive management.

**Species of Management Concern**

Species of Management Concern is the study of species, subspecies, populations, or geographic segments of populations that warrant management or conservation attention, as identified by a natural resource management agency. Species of Management Concern may include a variety of species, including those that are considered at-risk, have economic or intrinsic value, or are overly abundant and therefore leading to management conflicts. This may include species specific subcategories, species guilds, and program areas, such as ARMI.
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