ROW Mitigation Models

DCNR
Natural Gas Advisory Committee
February 28, 2019

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Presentation Outline

1. DCNR ROW Application Process
2. Present Compensation Method
3. Potential New Mitigation Models
   a) Human Use Loss
   b) Ecological Service Loss
4. Other State/Agency Examples
5. Questions for Discussion
DCNR ROW Application & Review Process

1. Formal application
2. Pre-Survey Meeting
3. Survey
4. SFER Submission
5. Post-Survey Meeting
6. SFER Approval and ROW Agreement
7. Pre-Construction Meeting
Conditions and Concessions

- Project Need
- Alignment
- Width
- Aquatic Resource Impacts
- Invasives Mng.
- T&E Species
- Restoration

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License Agreement & Fees

- License (statutory), not easement
- All negotiated conditions included
- Fees (Current Compensation Model):
  - Up-front, lump-sum payment (20-year primary term)
  - Annual payments thereafter
  - Fee schedule based on FERC ROW & Land cost data published in Oil & Gas Journal (2006-2009)
  - Source examined real estate value from surrounding private land
  - + Stumpage
  - + Road use fees
New Potential Mitigation Models

**Ecosystem Services**
- The physical, chemical, or biological functions that a natural resource provides, thus directly or indirectly providing value to the public
- Examples:
  - Timber products
  - Habitat for wildlife
  - Water purification
  - Carbon sequestration
  - Stormwater retention
  - Air pollutant removal

**Human Use Services**
- The human uses of natural resources or their functions, providing direct value to the public
- Examples:
  - Fishing
  - Hunting
  - Hiking
  - Boating
  - Wildlife viewing

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Habitat Equivalency Analysis (HEA)

• HEA is NOT about the cost to restore the project impact

• Restoration is presumed to be required

• HEA is about the compensation for the services lost during the period of impact and recovery
HEA Proven to be Credible & Accepted

- Scientific, peer-reviewed literature

- Dept. of Interior Regulations, and used by USFWS, NOAA, USACE, USFS, USEPA, European Union

- Upheld in several court cases as a valid way to scale compensatory restoration
HEA – Lost Services Illustration

Damages = Lost Ecological Services During this Time Period

What would services have been “but for” the impact?
HEA – Lost Services Model

Service Level (%) vs. Year

Original State
Impact
Return to Original State

Recovery

Years: 2019 to 2039
Gain = Gained Ecological Services During this Time Period

HEA – Gained Services Illustration

Construction/Planting
Establishment
Maturity
HEA – Gained Services Model

Service Level (%)

Year

Construction

Establishment

Maturity
HEA Currency = DSAY

“Service-Acre”
- amount of services provided by one acre

“Service-Acre Year”
- amount of services provided by one acre over the course of a year

“Discounted Service-Acre Year” = “DSAY”
- amount of services provided by one acre over the course of a year, discounted for the time-value of money
HEA Damages Calculation

DSAYs Lost  \[\text{\color{red}DSAYs Lost}\]  \[\text{\color{red}DSAYs Lost}\]

DSAYs Gained  \[\text{\color{blue}DSAYs Gained}\]  \[\text{\color{blue}DSAYs Gained}\]

Damages

\text{\textit{cost}} to create X acres of habitat
for DSAYs Gained necessary
to offset DSAYs Lost
HEA Key Data & Assumptions

• **LOSS**
  – Acreage of project impact area
  – Service level loss in each year of analysis
    • Initial impact level
    • Recovery trend
    • Final level
  – Economic discount rate

• **GAIN**
  – Acreage of restoration project area
  – Service level gain in each year of analysis
    • Initial service level
    • Establishment trend
  – Economic discount rate
  – Restoration cost per acre
i-Tree Eco

• i-Tree is a state-of-the-art, peer-reviewed software suite from the USDA Forest Service that provides urban and rural forestry analysis and benefits assessment tools.

• i-Tree Eco is a flexible software application designed to use data collected in the field along with air pollution and meteorological data to quantify forest structure, environmental effects, and value.

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Field Data

Census or Plots

- Species
- DBH
- Land use
- Tree height
- Crown measurements
Ecological Service Outputs

Services
• Avoided Runoff
• Carbon Storage
• Carbon Sequestration
• Pollution Removal

Outputs
• Total annual amount
  – tons of C
  – Cubic ft / yr
  – Lbs / yr
• Unit values
• Total Annual Values ($)
Human Use Impact Analysis

- **Goal** = to measure the economic value of recreational opportunities lost
  - e.g., lost hunting trips
  - e.g., lost hiking days

- **Key Concepts/Tools**
  - Recreation Use Value: the value of recreation activity beyond what must be spent to enjoy it (synonymous with Consumer Surplus value)
  - Benefit Transfer Method: estimating values by transferring available information from studies in similar location/context (substitute for primary research)
Human Use Impact Analysis

• Key Data and Assumptions
  – Visitation numbers to forest/park
  – % of visitors likely to visit impacted project area
  – % of days/trips lost due to project
  – Recreation Use Value per day/trip

  • Benefit Transfer Analysis data sources
    – Delaware Water Gap study (2011)
    – USGS northeast region data (2004)
NPS - Susquehanna-Roseland
Delaware Water Gap and App. Trail

2012

Human Use
• Consumer Surplus and Benefit Transfer Analysis

Ecological Services
• HEA
• Impact Types:
  – Permanently lost
  – Cleared and Recovering
  – Maintained Scrub-Shrub

• Habitat Types:
  – Wetland
  – Upland
  – Floodplain
Other HEA Applications

• Gateway West Transmission Line – Dept. of Interior (Wyoming, Idaho – 2012)
• Liquified natural gas pipeline (Oregon – 2012)
  * Desvousges, et al. 2018
Questions

• Experience with use of these valuation methods?
• Strengths and weaknesses of methods?
• What data seems critical for us to gather?
• What assumptions seem critical or potentially subject to scrutiny?