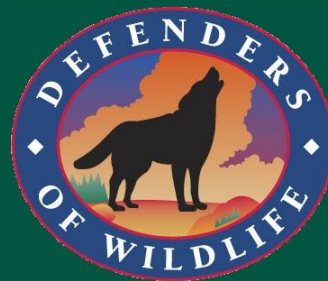


# Development of an Operational Benefits Estimation Tool for Habitat Conservation in the U.S.

Timm Kroeger (Defenders of Wildlife)  
John Loomis (Colorado State University)  
Frank Casey (Defenders of Wildlife)



**November 18, 2008**

*National Council for  
Science and the  
Environment*



# The Need for the “Benefits Toolkit”

Hundreds of studies that quantify the economic value of particular uses of undeveloped lands:

- Outdoor recreation (wildlife-associated and other)
- Ecosystem services (water supply, carbon sequestration, habitat provision)
- Increases in residential property values from nearby “open space”
- Conservation of T&E/R species or ecosystems

**But....**



## The Need for the “Benefits Toolkit” (contd.)

...**Economic values always depend on the particular context (site characteristics)**

- ⇒ Values reported in one study generally are not applicable to other sites
- ⇒ Developing estimates for a “new” site requires new, original study
  - Expensive
  - Time-consuming
  - ... often infeasible

**Problem:** No quick, easy way to develop reasonably reliable value estimates for an unstudied site

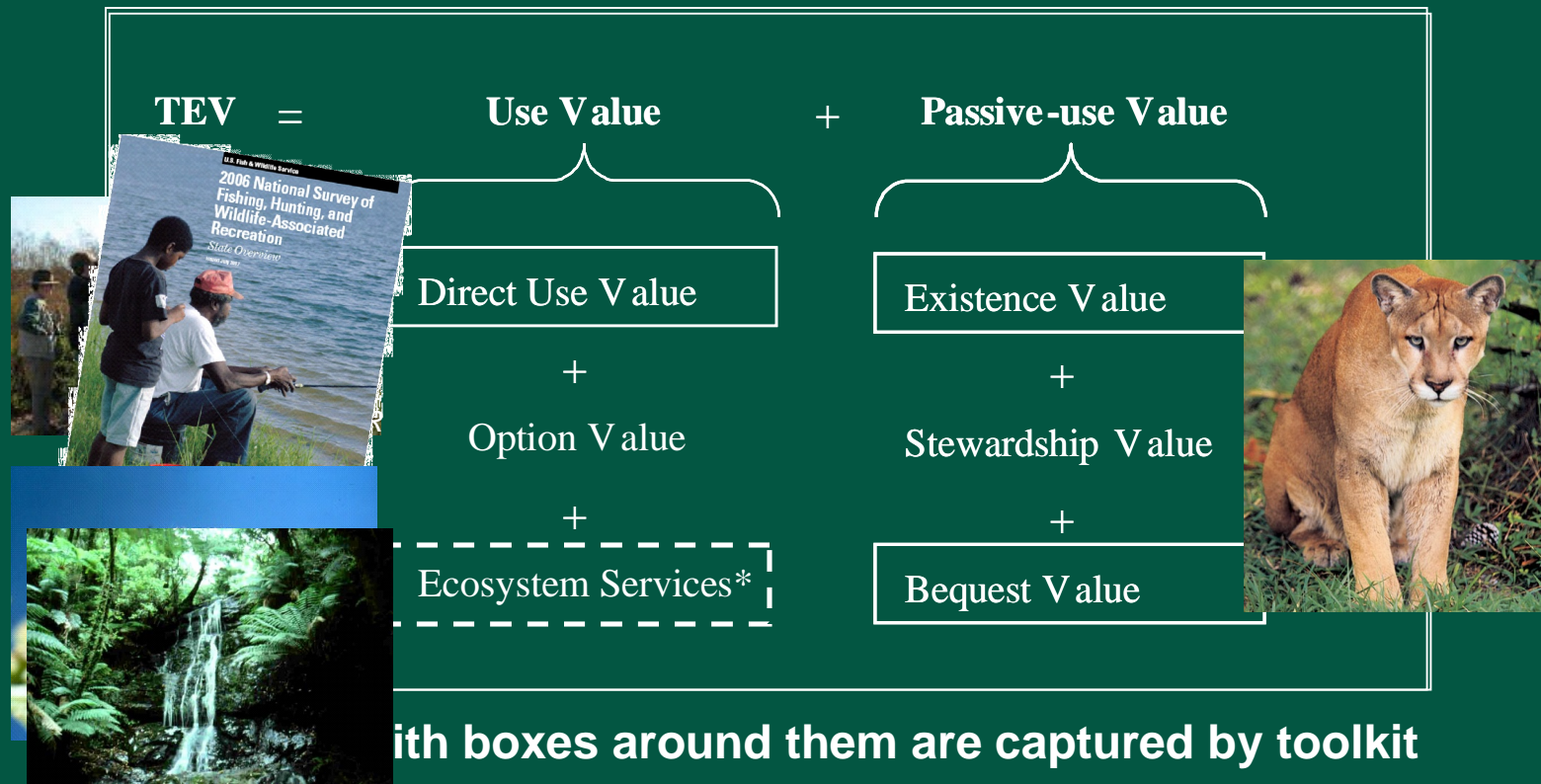
# The Benefits Toolkit

- Based on statistical analyses of literature findings (dozens to hundreds of studies, depending on particular use)
- Analyses identify significant variables that drive economic value of particular uses (hunting, open space premiums etc.)
- Significant variables are used to construct predictive valuation models for particular uses (hunting, ecosystem services etc.)
- User sets these variables such that they reflect the reality of their area of interest, generating customized value estimates for that area
- Models can be used to 1) predict changes in values associated with specific projects (habitat size change, land cover change, T&E species population change, water quality change) or 2) assess the current economic value of a site



# ECONOMIC VALUES INCLUDED IN TOOLKIT

“Economic value” = Total Economic Value (TEV)



(\* only some ecosystem services are captured in the wetlands models).

## Some uses of the Toolkit:

- **Quantify the public value of a site** (recreation; ecosystem service values; property value premiums) to 1) strengthen the case for public cost-share of conservation projects or for tax credits, or help qualify for state wildlife grants or federal conservation funds; 2) request increased public funds for protection of valuable natural lands
- **Assess the potential financial return from a conservation site 1) for site owners:** carbon sequestration estimates [through external models]; **2) for municipalities/counties:** property tax increases from OS
- **Promote buy-in** from municipalities for protection of land near residential areas, because of increase in assessment value of homes
- **Increase** awareness of the need for increased financial incentives for landowners and interest in the establishment of ecosystem markets and programs
- **Make the argument for zoning changes** that direct development away from valuable natural lands
- **Quantify** the potential losses from land conversion
- **Prioritize** conservation \$\$\$ for sites that generate the highest value per \$

## Specific project objectives:

- Review and synthesize literature on property value premium impacts of habitat conservation; conduct meta-analysis to estimate open space property value premium model
- Review and synthesize literature on community economic competitiveness impacts of habitat conservation
- Review and synthesize literature on economic values of wildlife and habitat; estimate valuation models



## Specific project objectives (contd.):

- Construct wildlife activity days model to estimate the relationship between the acreage of a conservation site and the resulting recreation use and value
- Assemble toolkit with easy-to-use models that allow users to estimate property premiums and wildlife-related recreation and passive use values associated with conserved lands

*MO DC*





# THE WILDLIFE HABITAT BENEFITS TOOLKIT

- Toolkit components and associated materials -

- **Valuation models** (spreadsheet-based)
- **Value tables/databases** (by activity, region, species)
- **Recreation use models** (number of visitors)
- **Technical reports** detailing analysis and model estimation; literature reviews
- **User manuals** for application of individual models (incl. examples)

**Property value premium estimator model**  
 Instructions: Fill in all cells marked ENTER >". (See accompanying user manual for detailed instructions and documentation.)

**STEP 1: Select shape of area of analysis in which property value premiums are analyzed**

**Average Fishing Values (per angler day)**  
 converted to 2006 base year

Species Category	N	NORTHEAST	N	SOUTHEAST	N	INTERMOUNTAIN	N	PACIFIC
Cold Water	58		20		116			13

**National Wildlife Refuge and State Wildlife Management Area  
 Freshwater Angler Days per Year (new Refuge/wildlife area)**

Inst... ge or wildlife management area acres, incor  
 put box.  
 documentation.

**Introduction to the Wildlife Habitat Benefits**

**Community Economic Competitiveness Analysis**

**Technical Documentation of Benefit Transfer and**

**Open Space Property Value Premium Analysis**

**USER MANUAL**  
 Benefit Transfer and Visitor Use Estimating  
 Models of Wildlife Recreation, Species and  
 Habitats

Dr. John Loomis and Leslie Richardson, Dept. of Agricultural and Resource  
 Economics, Colorado State University, Fort Collins, CO 80523-1172

June 2008

National Council for Science and the Environment  
 2006 Wildlife Habitat Policy Research Program  
 Project Topic 1H:  
 Development of an Operational Benefits Estimation Tool for the  
 U.S.

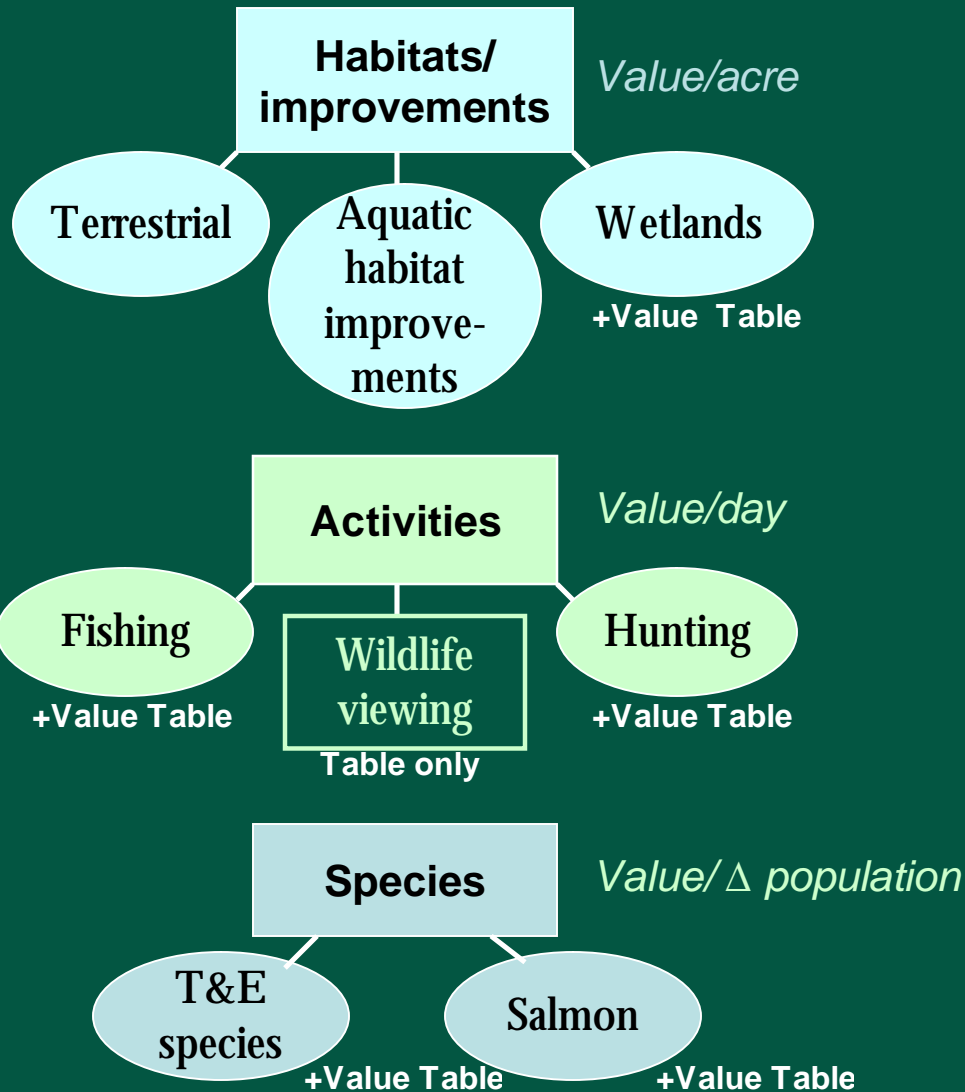
# - OVERVIEW OF MODELS -

## Valuation models

## Visitor use estimation models

Open space  
property value  
premiums

*% of property  
value*



NWR/ Wildlife  
Management  
Area

State-level

Fishing

Fishing

Hunting

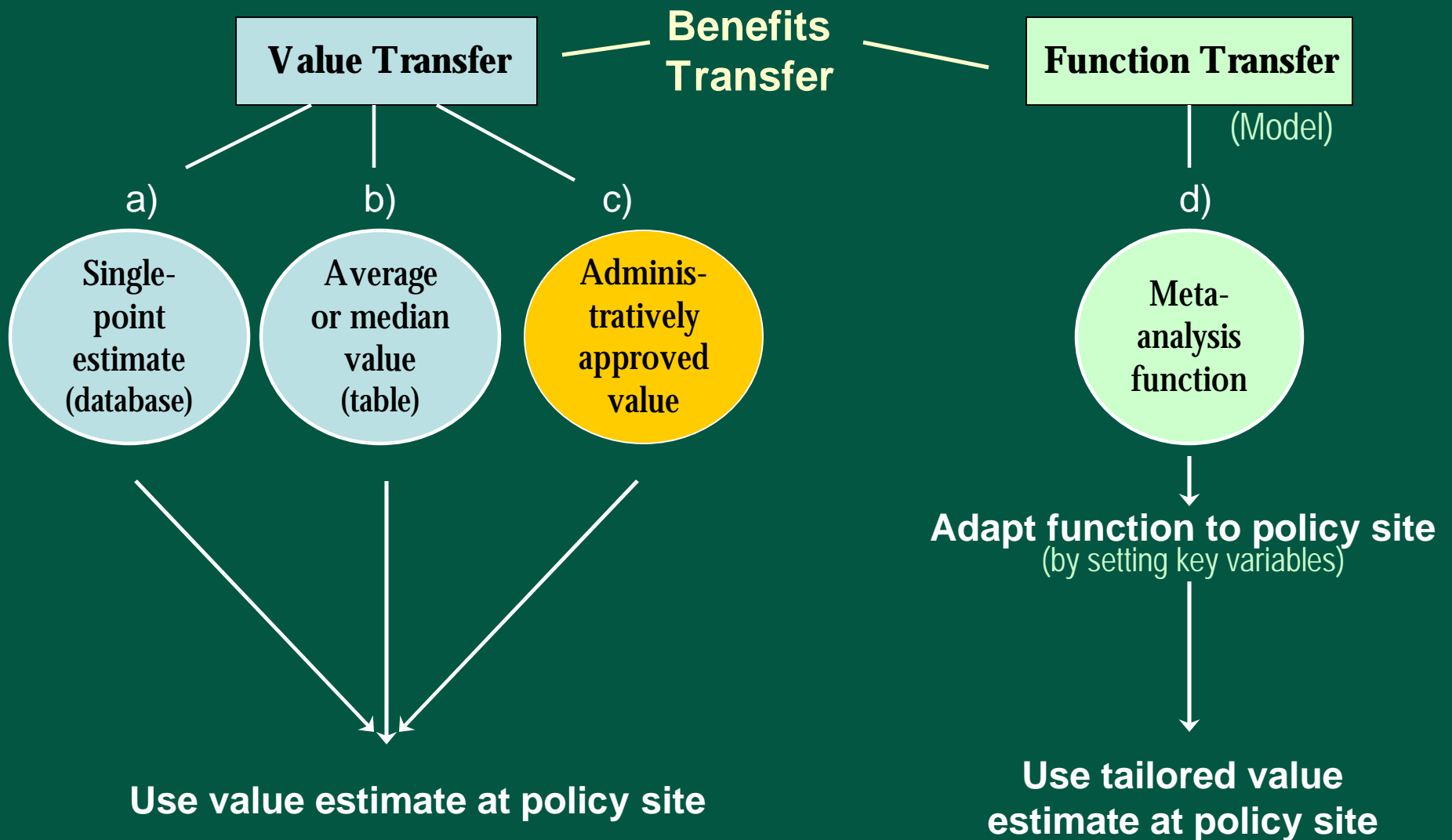
Hunting

Wildlife  
viewing

Wildlife  
viewing

*# of Activity days/yr*

# VALUATION APPROACHES OFFERED BY THE TOOLKIT

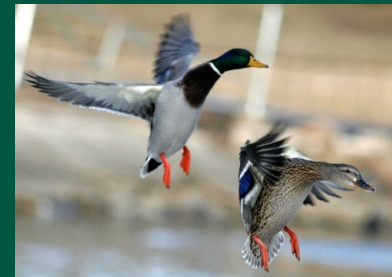


# APPLICATION EXAMPLES

1) Wetland values



2) Value of an area open to migratory bird hunting



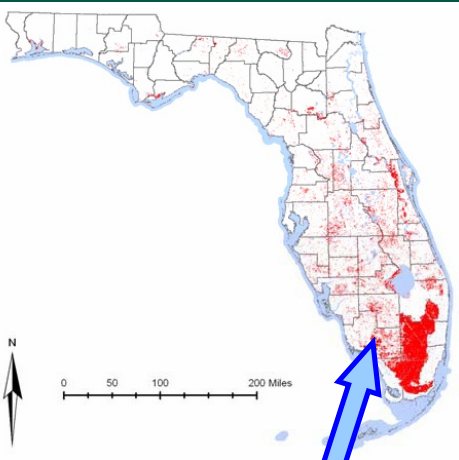
3) Value of open space for nearby properties



# Example 1: Wetland conservation: Value of a 350-acre freshwater wetland in FL

- Using wetland value  
**MODEL**

[Wetland Value per acre Meta Function 2](#)



## Wetland Valuation Model 2

<u>Total Economic Value of Wetlands per Acre</u>			
Instructions: Fill in all cells marked "ENTER >". See accompanying user manual for detailed instructions and documentation.			
STEP 1:	Enter average household income for the particular state the wetland is in; can be found in 'State HH Income' Tab- column B These are 2006 estimates, for updated information go to: <a href="#">U.S. Census Bureau Fact Finder</a>		
	ENTER >	\$45,495	
STEP 2:	Enter the total acres of the wetland to be valued		
	ENTER >	350.00	
STEP 3:	Enter share of wetland acres for the particular state the wetland is in, can be found on 'Share' Tab, Column D		
	ENTER >	0.23	
STEP 4:	Place a 1 next to the type of wetland to be valued; 0 otherwise.		
	ENTER >	1	Freshwater Marsh
	ENTER >	0	Saltwater Marsh
	ENTER >	0	Prairie Pothole
STEP 5:	Place a 1 next to the region the wetland is in; 0 otherwise Explanation of regions can be found in the 'ERS Farm Regions' Tab		
	ENTER >	0	Heartland
	ENTER >	0	Northern Crescent
	ENTER >	0	Mississippi Portal
	ENTER >	1	All Other Regions
STEP 6:	Place a 1 next to the ecosystem service to be valued; 0 otherwise		
	ENTER >	1	Flood Prevention
	ENTER >	1	Water Quality
	ENTER >	0	Water Supply
	ENTER >	1	Recreational Fishing
	ENTER >	0	Commercial Fishing
	ENTER >	0	Birdhunting
	ENTER >	1	Birdwatching
	ENTER >	0	Amenity
	ENTER >	0	Habitat
OUTPUT			
		\$25	Flood prevention
		\$139	Water Quality
		\$0	Water Supply
		\$40	Recreational Fishing
		\$0	Commercial Fishing
		\$0	Birdhunting
		\$194	Birdwatching
		\$0	Amenity
		\$0	Habitat
Total for all Ecosystem Services---->		\$398	\$/ Acre (2006 base year)
		\$139,291	Total Annual \$ Value of Wetland

**Total  
value/year**

# Example 1: Wetland conservation: Value of a 350-acre freshwater wetland in FL

- Using wetland value **TABLE/DATABASE**

[Wetland Value Table](#)

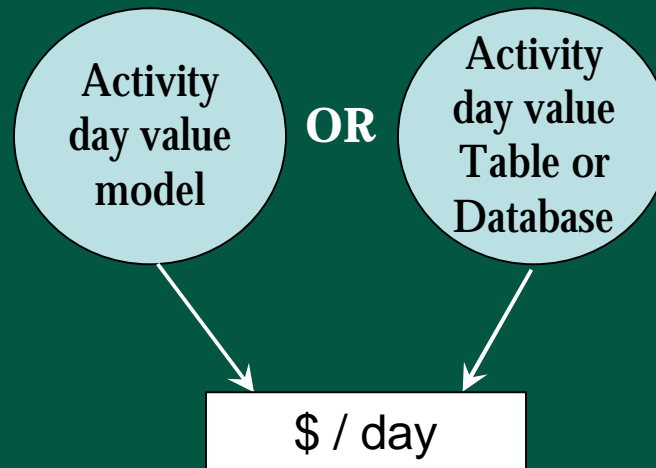
**Only studies for coastal wetlands in FL!**

*Florida Fish and Wildlife Conservation Commission (2005)*

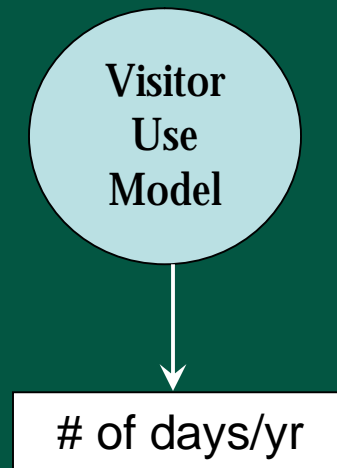
Study	State	Total Val	\$/Acre	real Acres	Coastal	Year	Flood	Quality	Quantity	RecFish	ComFish	Single	BirdHunt	BirdWatch	Storm	Amenity	Habitat	Publish	CS	PS	TotRev	Method
<b>NE</b>																						
Amacher et al.(1989)	MI	37740	\$33.48	1700	1	1989	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0 HP
Amacher et al.(1989)	MI	972400	\$172.54	8500	1	1985	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0 NFI
Amacher et al.(1989)	MI	1321800	\$332.26	6000	1	1985	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0 TCM
Amacher et al.(1989)	MI	2457000	\$617.62	6000	1	1986	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0 TCM
Amacher et al.(1989)	MI	8850000	\$2,224.63	6000	1	1985	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0 NFI
Amacher et al.(1989)	MI	3.61E+09	\$908,492.14	6000	1	1986	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0 EA
Gupta, Foster(1975)	MA	417760	\$78.76	8000	0	1972	0	0	0	1	0	0	1	0	0	0	1	1	1	0	0	0 RC
Gupta, Foster(1975)	MA	646978	\$115.86	8422	0	1972	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0 RC
Gupta, Foster(1975)	MA	263099.3	\$253.23	1567	0	1972	0	0	0	0	0	0	0	1	0	1	1	1	1	0	0	0 RC
Gupta, Foster(1975)	MA	\$4,223.02			0	1972	0	0	1	0	0	0	0	0	0	0	0	1	0	1	0	0 RC
Joworski, Eugene (1978)	MI	68911605	\$981.85	105855	1	1980	0	0	0	1	1	0	1	1	0	0	0	0	0	0	0	1 RC
Lant,Tobin(1989)	IL	216383.4	\$154.74	2109	0	1987	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0 CVM
Lant,Tobin(1989)	IA	1251741	\$1,703.88	1108	0	1987	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0 CVM
Joworski, Eugene (1978)	MI	1.48E+08	\$2,110.00	105855	1	1980	0	1	1	1	1	0	0	0	0	0	1	0	0	1	0	0 RC
Mullarkey, D (1997)	VI	1484120	\$20,348.92	110	0	1996	1	1	0	0	0	0	1	0	0	0	1	0	1	0	0	0 CVM
Thibodeau,Ostro(1981)	MA	17070000	\$3,016.44	8535	0	1976	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0 RC
Thibodeau,Ostro(1981)	MA	861096.2	\$152.16	8535	0	1970	0	0	0	1	0	0	1	1	0	0	0	1	1	0	0	0 CVM
Thibodeau,Ostro(1981)	MA	1280250	\$226.23	8535	0	1970	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0 HP
Thibodeau,Ostro(1981)	MA	13314600	\$2,352.83	8535	0	1970	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0 RC
<b>SE</b>																						
Batie ,Wilson(1978)	VA	72223.95	\$1.70	63915	1	1969	0	0	0	0	1	1	0	0	0	0	0	0	1	0	1	0 NFI
Batie ,Wilson(1978)	VA	9206.96	\$2.47	5614	1	1969	0	0	0	0	1	1	0	0	0	0	0	0	1	0	1	0 NFI
Batie ,Wilson(1978)	VA	12449.36	\$2.84	6622	1	1969	0	0	0	0	1	1	0	0	0	0	0	0	1	0	1	0 NFI
Batie ,Wilson(1978)	VA	1848.64	\$6.39	436	1	1969	0	0	0	0	1	1	0	0	0	0	0	0	1	0	1	0 NFI
Batie ,Wilson(1978)	VA	85691.81	\$20.56	6287	1	1969	0	0	0	0	1	1	0	0	0	0	0	0	1	0	1	0 NFI
Batie ,Wilson(1978)	VA	244676	\$161.71	2282	1	1969	0	0	0	0	1	1	0	0	0	0	0	0	1	0	1	0 NFI
Batie ,Wilson(1978)	VA	159566.9	\$213.35	1128	1	1969	0	0	0	0	1	1	0	0	0	0	0	0	1	0	1	0 NFI
Bell(1989)	FL	28871328	\$53.72	310537	1	1984	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0 NFI
Bell(1997)	FL	34371900	\$120.21	431266	1	1984	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0 NFI
Bell(1997)	FL	50414756	\$793.02	95882	1	1984	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0 NFI
Bergstrom,Stoll,et al. (19)	LA	27365000	\$12.78	3E+06	1	1986	0	0	0	1	0	0	1	0	0	0	0	0	1	1	0	0 CVM
Breaux ,Farber,Day(1995)	LA	153982.4	\$61.20	2860	1	1985	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0 RC
Breaux ,Farber,Day(1995)	LA	85557	\$226.38	570	1	1985	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0 RC
Breaux ,Farber,Day(1995)	LA	26697.2	\$6,494.40	6.2	1	1985	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0 RC
Chabreck,R.H.(1979)	LA		\$5.85		1	1977	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1 MV
Chabreck,R.H.(1979)	LA		\$14.48		0	1977	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1 MV
Chabreck,R.H.(1979)	LA	241228.8	\$0.81	446720	1	1973	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1 MV
Chabreck,R.H.(1979)	LA	110762.4	\$0.86	194320	0	1973	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1 MV
Dillman,Hook(1993)	SC	265507.5	\$160.18	2500	0	1992	1	1	1	1	1	1	0	1	0	1	1	0	1	0	0	0 CVM
Farber(1987)	LA	64000	\$0.60	160000	1	1980	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0 NFI
Farber(1988)	LA	6513000	\$15.11	650000	1	1985	0	0	0	0	1	0	0	1	1	0	0	0	1	1	0	0 CVM
Farber, Costanza(1987)	LA	2.73E+08	\$56.50	7E+06	1	1983	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0 NFI
Farber, Costanza(1987)	LA	4.95E+09	\$1,022.57	7E+06	1	1983	0	1	0	1	1	0	0	0	0	1	0	0	1	0	0	0 EA
Farber(1988)	LA	4238000	\$9.83	650000	1	1985	0	0	0	1	0	0	1	1	0	0	0	0	1	1	0	0 TCM
Lynne,Conroy(1999)	FL	137891.6	\$0.41	501424	1	1974	0	0	0	0	1	1	0	0	0	0	0	0	1	0	1	0 NFI
Shabman,L.A. & Batie(1989)	LA	47273355	\$1,314.87	54225	1	1984	0	0	0	1	1	0	1	1	1	1	1	1	1	1	0	0 RC
Whitehead(1990)	KY	4350000	\$1,312.15	5000	0	1989	1	1	1	1	0	0	1	1	0	0	1	1	1	0	0	0 CVM
<b>Intermountain</b>																						
Hovde,Brett(1993)	ND	18.39	\$9.25	3	0	1993	1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	1 RC
Hovde,Brett(1993)	ND	15.16	\$5.72	4	0	1993	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1 RC
Hovde,Brett(1993)	ND	33.84	\$6.38	8	0	1993	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1 RC
Hovde,Brett(1993)	ND	190.4	\$16.89	17	0	1993	0	1	0	1	0	0	1	0	0	0	1	1	0	0	0	1 RC
Hovde,Brett(1993)	ND	43164	\$29.59	2200	0	1993	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1 RC
Johnson,Linder(1986)	SD	33855418	\$39.06	1E+06	0	1982	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0 CVM
Poor,Joan(1997)	NE	12700000	\$456.11	41995	0	1996	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0 CVM
<b>Pacific</b>																						
Cooper, Loomis(1991)	CA	16490000	\$292.59	85000	0	1987	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0 TCM
Cooper, Loomis(1991)	CA	64685000	\$1,147.76	85000	0	1987	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0 CVM
Creel, Loomis(1992)	CA	6970000	\$123.67	85000	0	1989	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0 CVM
Creel, Loomis(1992)	CA	32980000	\$585.19	85000	0	1989	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0 CVM
Creel, Loomis(1992)	CA	40460000	\$717.91	85000	0	1989	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0 CVM
Loomis, Hanemann(1991)	CA	2.18E+08	\$5,657.34	58000	0	1990	0	0	0	0	0	0	1	1	0	0	1	1	1	0	0	0 CVM
Loomis, Hanemann(1991)	CA	62680000	\$2,363.38	40000	0	1990	0	0	0	0	0	0	1	1	0	0	1	1	1	0	0	0 CVM
<b>Canada</b>																						
Phillips,Haney(1993)	Canad	4076400	\$51.23	120000	0	1993	0	0	0	0												

## Example 2: Estimating the net value (consumer surplus) of a 500-acre mixed private/public site in Nebraska for migratory bird hunting

### STEP 1: Estimate value/visitor day



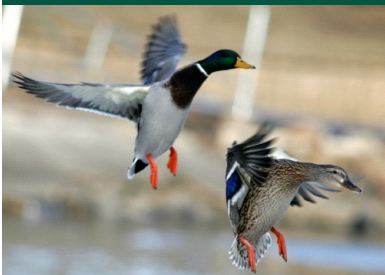
### STEP 2: Estimate # of visitors/year



$\times$

=

\$ / yr for activity at the site





## Example 2: net value of a 500-acre mixed private/public wetland in Nebraska for migratory bird hunting

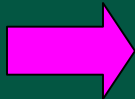
### STEP 1: Value per activity day – OPTION 1: Use value Table with average values

#### Hunting Value Table

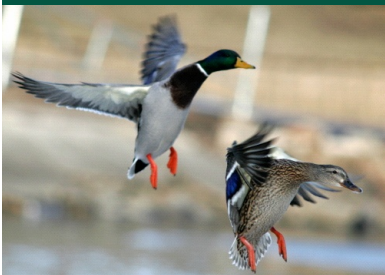
#### **Average Hunting Values (per hunter day)**

converted to 2006 base year

Species Category	N	NORTHEAST	N	SOUTHEAST	N	INTERMOUNTAIN	N	PACIFIC	N	ALASKA	N	NATION
<b>Big Game</b>	142		66		141		30		13		6	
Average		\$58.45		\$54.94		\$71.37		\$59.16		\$62.82		\$186.12
Median		\$52.15		\$50.34		\$58.43		\$54.31		\$50.07		\$192.02
<b>Small Game</b>	11		1		27		4				7	
Average		\$32.40		\$165.04		\$65.51		\$155.62				\$69.07
Median		\$33.88		\$165.04		\$46.67		\$140.07				\$74.57
<b>Waterfowl</b>	39		24		31		12				2	
Average		\$35.99		\$45.85		\$51.77		\$64.82				\$134.23
Median		\$29.21		\$35.42		\$35.42		\$47.98				\$134.23
<b>AVERAGE, all game</b>		\$42.28		\$88.61		\$62.88		\$93.20		\$62.82		\$129.81



**OPTION 2: Use value Database with over 500 observations for hunting values to search for a study that matches your context**





## Example 2: net value of a 500-acre mixed private/public wetland in Nebraska for migratory bird hunting

### STEP 1: Value per activity day – OPTION 2: Use value Model

#### Value of Hunting per Hunter Day

Instructions: Fill in relevant cells marked "ENTER >" associated with the region the hunting value is for, the land ownership type, and if the type of species being valued is waterfowl.  
 Hit the enter key to get the value per day in output box.  
 See accompanying user manual for detailed instructions and documentation.

STEP 1: Enter a 1 next to the site location; 0 otherwise

ENTER >	1	Intermountain region (AZ, CO, ID, KS, MT, ND, NE, NM, NV, SD, UT, WY)
ENTER >	0	Northeast region (CT, DE, IA, IL, IN, MA, MD, ME, MI, MN, MO, NH, NJ, NY, OH, PA, RI, VT, WI, WV)
ENTER >	0	Pacific region (CA, HI, OR, WA)
ENTER >	0	Southeast region (AL, AR, FL, GA, KY, LA, MS, NC, OK, SC, TN, TX, VA)

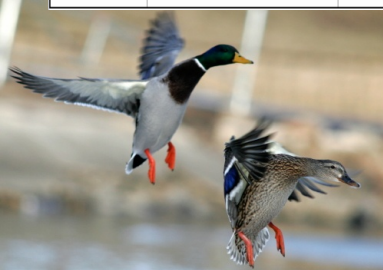
STEP 2: Enter a 1 if land ownership is public; 0 if private or mixed public private)

ENTER >	0
---------	---

STEP 3: Enter BIG, SMALL or WATER in the appropriate cell(s) depending on the type(s) of hunting practiced

ENTER >		Enter "BIG" if the site supports BIG GAME hunting OR if you want to estimate TOTAL hunting instead of individual BIG/SMALL/Waterfowl hunting; otherwise, leave cell blank
ENTER >		Enter "SMALL" if the site supports SMALL GAME hunting; otherwise, leave cell blank.
ENTER >	Water	Enter "WATER" if the site supports WATERFOWL hunting; otherwise, leave cell blank.

OUTPUT: Big Game/TOTAL hunting:	\$0.00	\$/ Hunter Day (2006 base year)
OUTPUT: Small Game:	\$0.00	\$/ Hunter Day (2006 base year)
OUTPUT: Waterfowl:	\$51.18	\$/ Hunter Day (2006 base year)



Hunting Value Per Day Model

# Example 2: net value of a 500-acre mixed private/public wetland in Nebraska for migratory bird hunting

## STEP 2: State-level visitation attributable to the site

### State Migratory Bird Hunting Days

**Instructions:** Fill in relevant cells marked 'ENTER >' associated with acres of land and state income and population  
Hit the enter key to get the change in migratory bird hunting days.  
See accompanying user manual for detailed instructions and documentation.

*CURRENT STATE VALUES (from the 'State Variable Input Tab')*

**STEP 1:** Enter the two-letter state abbreviation to obtain the current acres of each type of land within the state of interest (from the 'State Variable Input Values' Tab)

ENTER >

acres:

647,600	Federal Land
19,469,200	Cropland
826,000	Private Forest Land
1,178,200	Total Wetlands

**STEP 2:** Household median income for the state of interest (from the 'State Variable Input Values' Tab)

These are 2006 estimates, for updated information go to:

[U.S. Census Bureau Fact Finder](#)

ENTER >

(The 2006 value is filled in automatically; if you have more recent data, enter that into the cell)

+ 500

OUTPUT  State Migratory Bird Hunting Days / capita / year

**STEP 3:** State population (from the 'State Variable Input Values' Tab)

These are 2007 estimates, for updated information go to:

[U.S. Census Bureau Fact Finder](#)

ENTER >

(The 2007 value is filled in automatically; if you have more recent data, enter that into the cell)

OUTPUT  State Total Migratory Bird Hunting Days / year

*STATE VALUES WITH MANAGEMENT/POLICY ACTION*

**STEP 1a:** Enter the total state-wide number of acres of each type of land under the proposed project

ENTER >	<input type="text" value="647,600"/>	Federal Land
ENTER >	<input type="text" value="19,469,200"/>	Cropland
ENTER >	<input type="text" value="826,000"/>	Private Forest Land
ENTER >	<input type="text" value="1,178,700"/>	Total Wetlands

OUTPUT  Total Migratory Hunting Days / year for the site of interest

CHANGE

OUTPUT  Change in Total Migratory Bird Hunting Days / year

[State Level Wildlife Viewing Visitor Use Estimating Model](#)

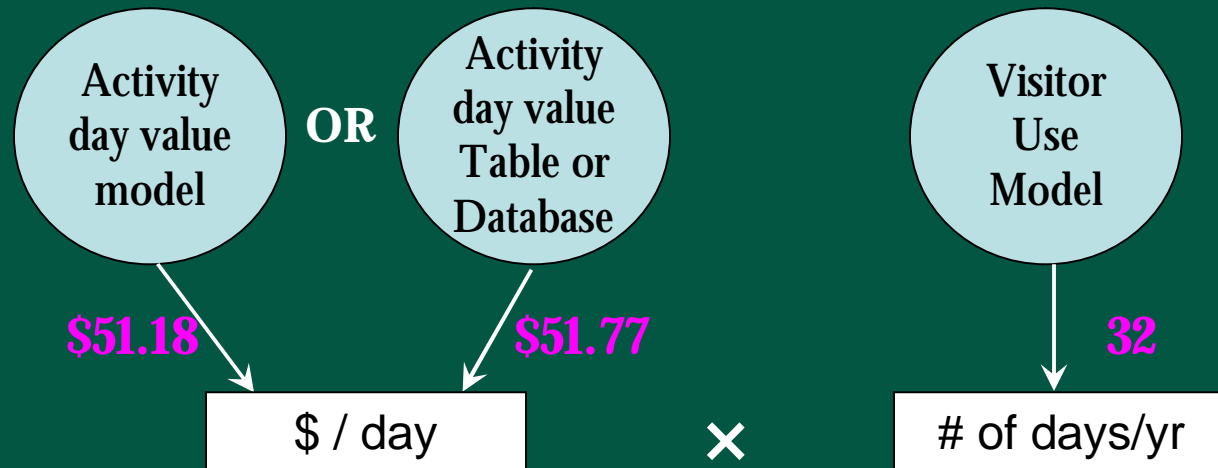
# of state-wide bird hunting days from a 500-acre wetland



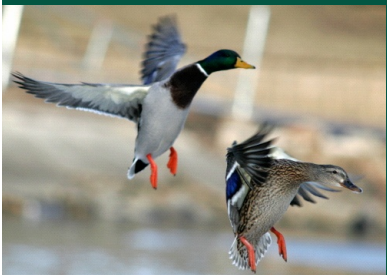
Example 2: Estimating the net value of a 500-acre mixed private/public wetland in Nebraska for migratory bird hunting

STEP 1: Estimate value/visitor day

STEP 2: Estimate # of visitors/year

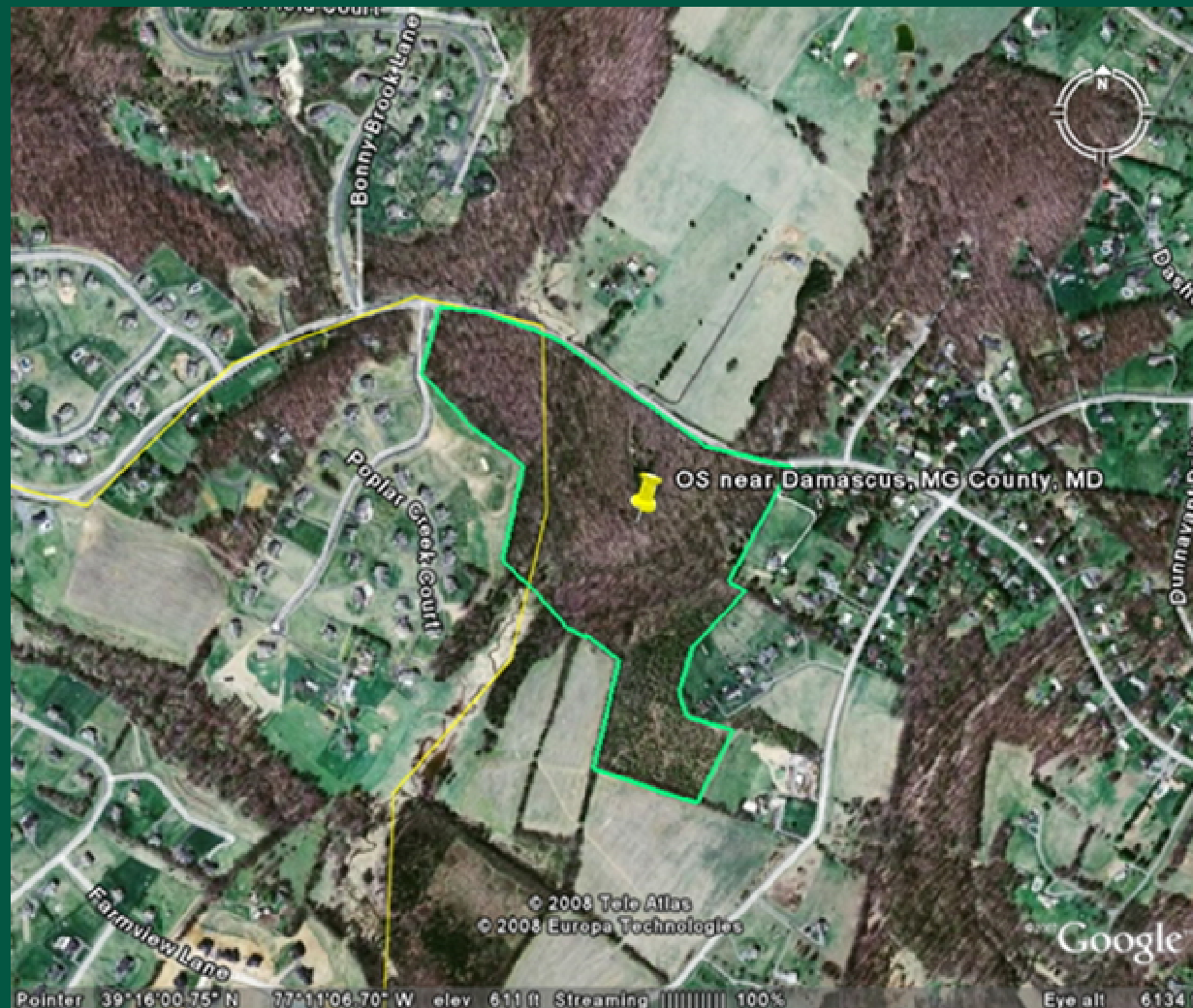


= ~\$1640/yr for migratory bird hunting at the site



## Example 3: Open space-related property value premiums

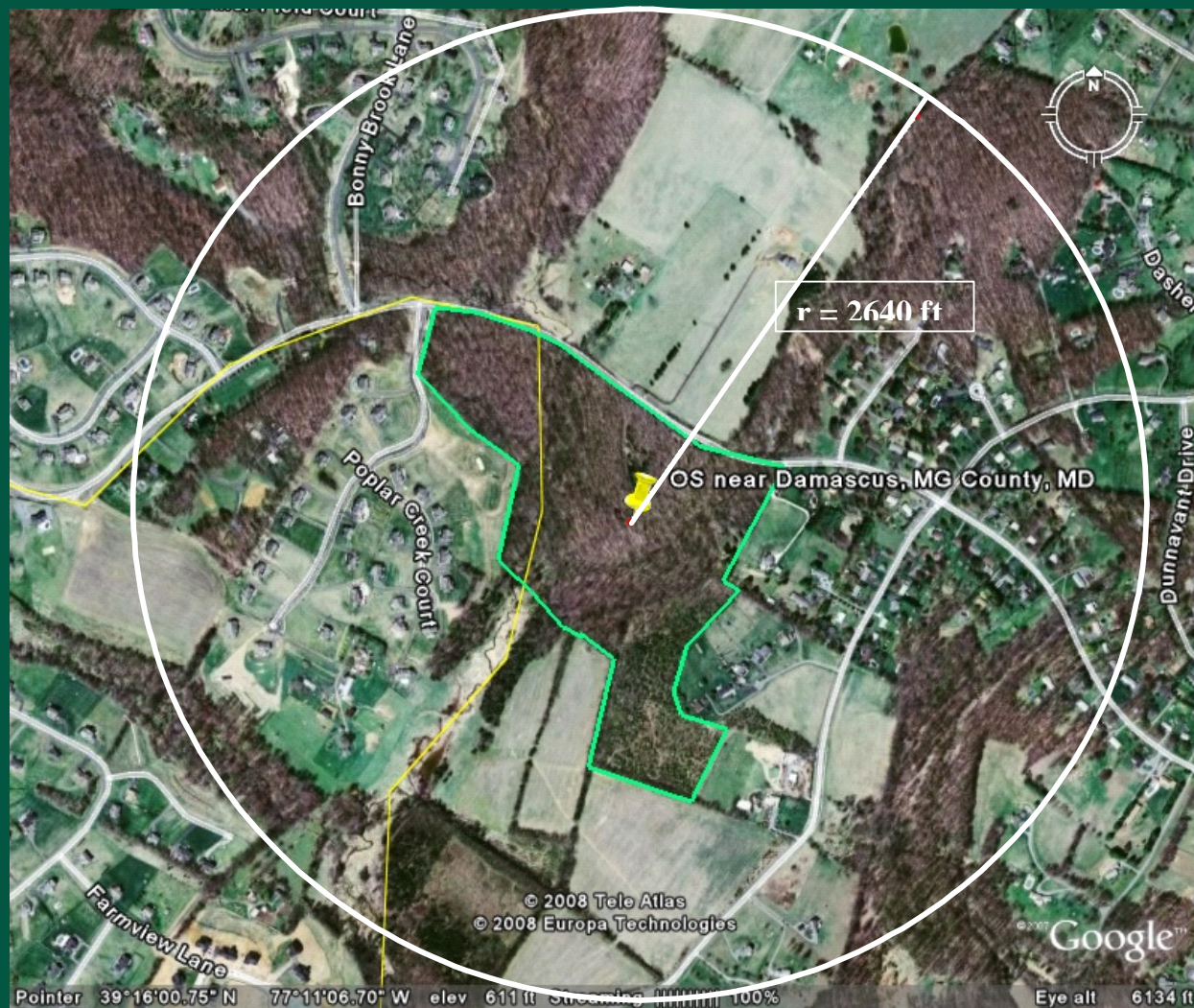
Case A: Small open space: 50-acre forested area, privately owned, under conservation easement; suburban Maryland





### Example 3: Open space-related property value premiums

**Q:** What are the property value impacts of this OS within ½-mile radius?



# Open Space Property Value Estimator Model

## Property value premium estimator model

Instructions: Fill in all cells marked "ENTER >". (See accompanying user manual for detailed instructions and documentation.)

[OS property premium model](#)

### STEP 1: Select shape of area of analysis in which property value premiums are analyzed

ENTER >  Enter "C" for circular and "R" for rectangular shape of area

### STEP 2: Enter the radius (circular area) or length and width (rectangular area) of the area of analysis

ENTER >  Radius of area in feet

OUTPUT: **503** Size of study area (acres)

### STEP 3: Enter the size of the open space

ENTER >  Size in acres of the open space whose property value impact is to be estimated

OUTPUT: **9.9** %OSChange. Percentage of the study area occupied by the open space of interest.  
Example: A 20 percent increase in open space in the area of interest is indicated as "20".

### STEP 4: Enter the appropriate values for the indicator variables

ENTER >  FOR. Enter "1" if the open space is a forest. Otherwise, enter "0".

ENTER >  PARK. Enter "1" if the open space is a park. Otherwise, enter "0".

ENTER >  AG. Enter "1" if the open space is agricultural land. Otherwise, enter "0".

ENTER >  PROT. Enter "1" if the open space is protected. Otherwise, enter "0". Protection is defined as the absence of the possibility of development (i.e., easement, public ownership).

ENTER >  PRIV. Enter "1" if the open space is privately owned. Otherwise, enter "0".

$P_{OS}$  =  % increase in average residential property value from open space of interest

### STEP 5: Enter the number of residential properties located in the area

ENTER >  Number of properties located in study area. NOT

ENTER >  Average value of properties (\$)

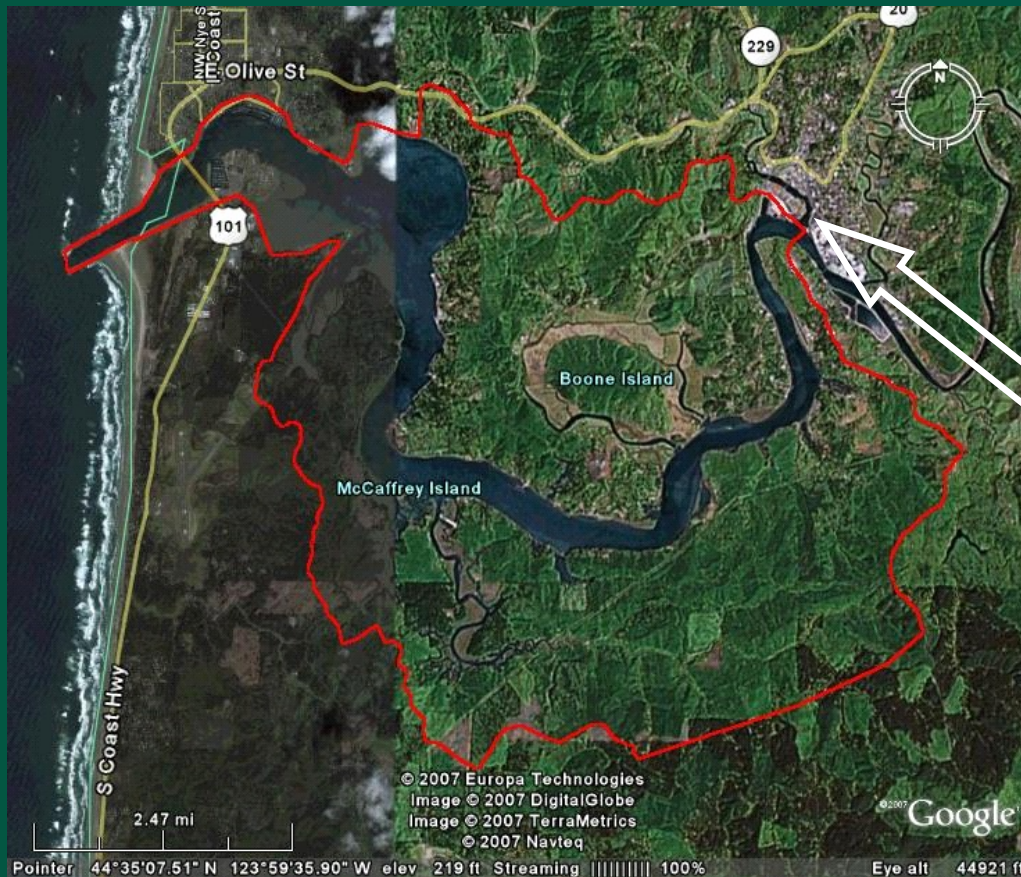
OUTPUT: **\$5,415,004** Estimated total property premium in study area

**Use public assessor/private appraiser or Census data to get this info**



## Case B: large open space

### Yaquina Bay Conservation Opportunity area (OR)

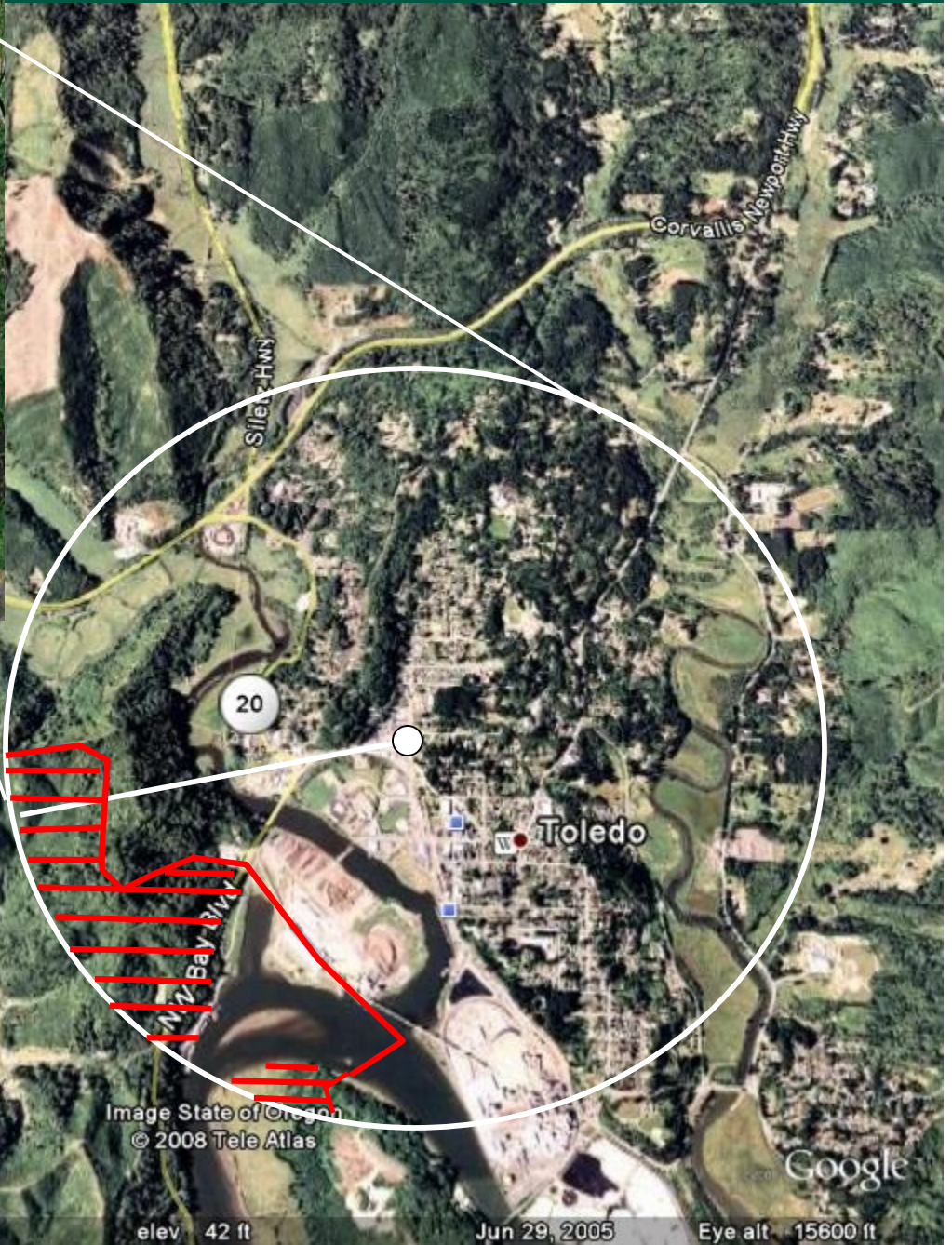
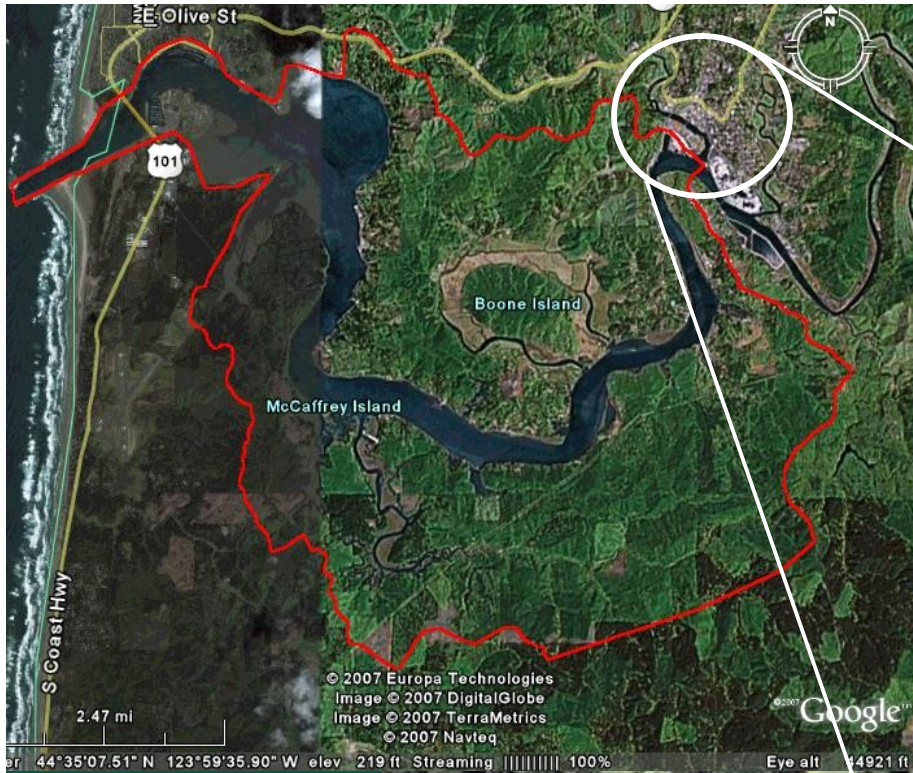


- Mostly privately owned
- Unprotected

**Q:** Property value premiums in Toledo urban area attributable to Yaquina Bay COA?



## Example: large open space



Yaquina Bay  
open space =  
7% of area in  
1-mile radius  
of average  
property



## Property value premium estimator model

Instructions: Fill in all cells marked "ENTER >". (See accompanying user manual for detailed instructions and documentation.)

### STEP 1: Select shape of area of analysis in which property value premiums are analyzed

ENTER >  Enter "C" for circular and "R" for rectangular shape of area

### STEP 2: Enter the radius (circular area) or length and width (rectangular area) of the area of analysis


OUTPUT:            **0**            Size of study area (acres)

### STEP 3: Enter the size of the open space

ENTER >  Size in acres of the open space whose property value impact is to be estimated

OUTPUT:            **7.0**            %OSChange. Percentage of the study area occupied by the open space of interest.  
 Example: A 20 percent share of open space in the area of interest is indicated as "20".

### STEP 4: Enter the appropriate values for the indicator variables (see the Land Cover Definitions tab for how to code a particular land cover)

ENTER >  **FOR.** Enter "1" if the open space is a forest. Otherwise, enter "0".

ENTER >  **PARK.** Enter "1" if the open space is a park. Otherwise, enter "0".

ENTER >  **WET.** Enter "1" if the open space is a wetland. Otherwise, enter "0".

ENTER >  **PROT.** Enter "1" if the open space is protected. Otherwise, enter "0". Protection is defined as the absence of the possibility of development (i.e., easement, public ownership).

ENTER >  **PRIV.** Enter "1" if the open space is privately owned. Otherwise, enter "0".

$P_{OS}$  =            **4.1**            % increase in average residential property value from open space of interest

### STEP 5: Enter the number of residential properties located in the area

ENTER >  Number of properties located in study area. NOTE: Include only single-family homes.

ENTER >  Average value of properties (\$)

OUTPUT:            **\$1,963,428**            Estimated total property premium in study area attributable to open space of interest

# ADDING THE OUTPUTS OF INDIVIDUAL TOOLKIT COMPONENTS

**Activity value models** (wildlife-associated recreation)

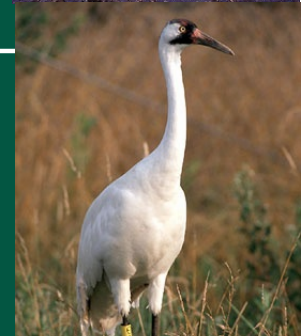
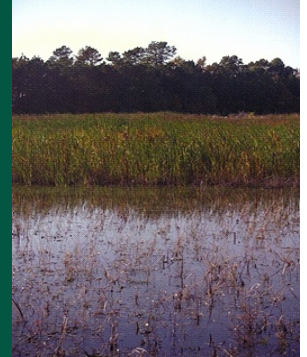
+ **Ecosystem Service value models** (wetlands, terrestrial, aquatic)

+ **T&E/R Species value models** (T&E/R, Salmon)

+ **Open Space Property Value Premium model**

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= **“Total” economic conservation value of site**







# OUTREACH

- Workshop with 17 state and tribal wildlife planners (April '08)
- Invited presentation at Collier County Rural Land Stewardship Committee Meeting (June '08)
- Manuscript submitted to Western Economic Forum (Sep. '08); more in prep.
- USFS and BLM economists ('08)
- Notification of state wildlife agencies (Nov. '08)
- USFS and BLM natural resource economics training courses ('08- )
- Land trusts (LTA Rally 2008 – Sep. '08; workshops '09)
- Web pages: Defenders of Wildlife Conservation Economics; NCSE WHPRP (Nov. '08)
- Presentations - AFWA (Nov. '08); conservation organizations (WWF, TNC, NWF – '09)
- County planning agencies (National Assoc. of County Planners – '08/'09)
- Workshops with state agencies ('09)

## Many thanks to:

- Dr. Alan Randall
- Dr. John Loomis
- Dr. Frank Casey
- Participants in our April 2008 workshop
- WHPRP committee

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