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

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# 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





#### 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 <u>predictive</u> 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)



### ith boxes around them are captured by toolkit

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

### Some uses of the Toolkit:

- Quantify the <u>public</u> 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 metaanalysis 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



# THE WILDLIFE HABITAT BENEFITS TOOLKIT

- Toolkit components and associated materials -

- Valuation models (spreadsheetbased)
- 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 structions: Fill in all cells marked ENTER >". (See accompanying user manual for detailed instructions and documentation 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 PACIE Cold Wate National Wildlife Refuge and State Wildlife Management Area Freshwater Angler Davs per Year (new Refuge/wildlife area) e or wildlife management area acres, incor tput box. Introduction to the Wildlife Habitat Benefits Hocumentation **Community Economic Competitiveness Analysis** Technical Documentation of Benefit Transfer and <sup>1</sup>Co Departm Open Space Property Value Premium Analysis Dept. of . USER MANUAL Bureau Conse Benefit Transfer and Visitor Use Estimating Models of Wildlife Recreation, Species and Habitats Develo Dr. John Loomis and Leslie Richardson, Dept. of Agricultural and Resourc conomics, Colorado State University, Fort Collins, CO 80523-1172 Developn Develo June 2008 ation. S Loo Dep 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**



## 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

Valuation Model 2

etland '

# - Using wetland value MODEL

Wetland Value per acre Meta Function 2





Florida Fish and Wildlife Conservation Commission (2005)

<u>Total Econor</u>	nic Value of Wetl	ands per Acre	
Instructions: Fill in all s	alle marked "ENITER >"		
See accor	npanying user manual for deta	iled instructions and documentation.	
CTED 4.	Foto and bound and		is in our he found in 1944 Hill become! Take as home D
STEP 1:	These are 2006 estimates,	for updated information go to:	U.S. Census Bureau Fact Finder
	,		
	ENTER >	\$45,495	
STEP 2:	Enter the total acres of the	wetland to be valued	
	ENTER >	350.00	
STED 3.	Enter share of wotland ac	ree for the particular state the wetland is in	can be found on 'Share' Tab. Column D
51EF 5.	Litter share of wettand act	Les for the particular state the wettand is m,	can be found on share Tab, column b
	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	Prarie Pothole
STEP 5:	Place a 1 next to the regio	on the wetland is in: 0 otherwise	
	Explanation of regions ca	n be found in the 'ERS Farm Regions' Tab	
		0	Headland
		0	Northern Crossont
		0	Micelesinni Bortol
	ENTER >	1	All Other Regions
		· · · · · · · · · · · · · · · · · · ·	
CTED C.			
STEP 6:	Place a 1 next to the ecos	ystem 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
OUTDUT			
001201		\$25	Flood prevention
		\$139	Water Quality
		\$0	Water Supply
		\$40	Recreational Fishing
<b>Ota</b>		\$0	Commercial Fishing
		\$0	Birdhunting
-	1	\$194	Birdwatching
value	/ vear	\$0	Amenity
	J	\$U	Habitat
Total for all Ecosyste	m Services>	\$398	\$/ Acre (2006 base year)
			· · · · · · · · · · · · · · · · · · ·
		\$139,291	Total Annual \$ Value of Wetland
1			

#### 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	n Single	BirdHunt	BirdWatch	Storm	Amenity	Habita	t Publish C	S P	S Tot	Rev Method
NE																					
Amacher et al.(1989)	MI	37740	\$33,48	1700	1	1989	0	0	0	0	0	) 0	0	0	0	1	0	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	C	) 0	0	1	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	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	) ()	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	) ()	1	0	0 NFI
Amacher et al. (1989)	MI	3.61E+09	\$908,492.14	6000	1	1986	0	U	0	U 1	1		1	U	0	U		JU	1	0	UEA
Gupta, Foster(1975) Gupta, Foster(1975)	MA	6/6978	\$70.76 \$115.86	8422	0	1972	1	0	0	0			1	0	0	0	0	1 1	0	1	
Gupta, Foster(1975)	MA	263099.3	\$253.23	1567	0	1972	n	0	0	0	0	) 0 1 0	0	1	0	1		1 1	1	n	0 RC
Gupta, Foster(1975)	MA		\$4,223.02		0	1972		0		0	0	) 0	0	0	0	0	0	) 1	0	1	0 RC
Joworski, Eugene (1978)	MI	68911605	\$981.85	105855	1	1930	0	0	0	1	1	0	1	1	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 CVM
Lant,Tobin(1989)	IA	1251741	\$1,703.88	1108	0	1987	U		0	0	0	) (	0	0	0	0	0	) 1	1	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	1	0 RC
Mullarkey, D (1997) Thile de su Ostar (1994)	VVI NA 0	1484120	\$20,348.92	110	U	1996	1	1	U	U	U		1	U	0	U	1		1	0	
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Thibodeau Ostro(1981)	MA	1280250	\$226.23	8535	0	1970	0	0	0	0	0		0	0	0	1		1 1	1	0	
Thibodeau.Ostro(1981)	MA	13314600	\$2,352.83	8535	0	1970	0	1	0	0 0	0	0 0	0	0	Ő	O		1	1	0	0 RC
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Batie ,Wilson(1978)	VA	72223.95	\$1.70	63915	1	1969	0	U	U	U	1	1	U	U	U	U		J 1	U	1	
Batie, Wilson (1978) Batie, Milleon (1979)	VA	9206.96 10440.26	\$2.47 © 104	5614	1	1969	0	0	0	0	1	1	U	U 0	0	0		J 1	0	1	
Batie (Wilson(1970) Batie Wilson(1978)	VA	12449.30	⊉2.04 €6.39	136	1	1969	0	0	0	0	1	1	0		0	0		) I 1 1	0	1	
Batie Wilson(1978)	VA	85691.81	\$20.55	6287	1	1969	0	0	0	0	1	1	0	0	0	0		1 1	n	1	
Batie Wilson(1978)	VA	244676	\$161.71	2282	1	1969	0	Ō	0	Ō	1	1	Ō	0	Ō	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	) 1	0	1	0 NFI
Bell(1989)	FL	28871328	\$53.72	810537	1	1984	0	0	0	0	1	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	) 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	¢12.70	3E+06	1	1986	0	U	U	1	U		1	U	U	U		J 1	1	0	
Breaux,Farber,Day(1995) Breaux,Farber,Day(1995)	LA	153962.4 96667	\$61.2U ¢006.20	2860	1	1985	0	1	0	0			0	0	0	0		J I 1 1	0	1	
Breaux Farber Day(1995)	LA	26697.2	\$6 494 40	62	1	1985	0	1	0	0	0	) 0 1 0	0		0	0		1 1	0	1	0 RC
Chabreck.R.H.(1979)	LA	20001.2	\$5.85	0.2	1	1977	0	0	0	0	0	) <u> </u>	1	0	0	0		1	0	0	1 MV
Chabreck R.H.(1979)	LA		\$14.48		0	1977	0	0	0	0	0	0 0	1	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	) 1	0	0	1 MV
Chabreck, R.H. (1979)	LA	110762.4	\$0.86	194320	0	1973	0	0	0	0	0	) (	1	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	0	1	1	0	1	1		1	0	0 CVM
Farber(1987)	LA	64000	\$0.60	160000	1	1980	0	0	0	0			0	0	1	0	L L	J 1	0	1	U NFI
Farber(1966) Farber, Costanza(1997)	LA	513000 0 72E i 00	\$15.11 ¢EC EO	75,00	1	1985	0	0	0	1	1		1	1	0	0		J I 1 1	1	1	
Farber, Costanza(1907)		2.7 JE+00	\$1 022 57	7E+06	1	1903	0	1	0	1	1		0		1	0		1 1	0	<u></u>	
Farber(1988)	LA	4238000	\$9.83	650000	1	1985	0	0	0	1		0 0	1	1	0	0		1	1	0	ОТСМ
Lynne,Conroy(1001)	FL	137891.6	\$0.41	501424	1	1974	0	0	0	0	1	1	0	0	0	0	0	) 1	0	1	0 NFI
Shabman L.A. & Batie(19	LA	47273355	\$1,314.87	54225	1	1984	0	0	0	1	1	0	1	1	1	1	1	I 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	l 1	1	0	0 CVM
Intermountain																			-	-	
Hovde,Brett(1993)	ND	18.39	\$9.25	3	п	1993	1	1	n	Π	n	) n	n	0	0	1	1	0	0	0	1 RC
Hovde,Brett(1993)	ND	15.16	\$5.72	4	0	1993	Ö	Ó	Ō	Ő	0	) Ö	0	0	Ő	1	1		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	I 0	0	0	1 RC
Hovde,Brett(1993)	ND	190.4	\$16.89	17	0	1993	0	1	0	1	0	) (	1	0	0	1	1	I 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	1 RC
Johnson, Linder(1986)	SD	33855418	\$39.06	1E+06	0	1982	0	0	0	0			1	0	0	0	L	J 1	1	0	
Poor,Joan(1997)	NE	12700000	\$456.11	41995	U	1996	U	U	U	U	U	J U	U	U	U	U			1	U	
Pacific																					
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 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	) ()	1	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		1	0	0 CVM
Creel, Loomis(1992)	CA	40460000	\$717.91	85000 20000	0	1989	0	0	0	0				1		0		J 1	1	0	U CVM
Loomis, Hanemann(1991)	CA	2.186408	\$5,657.34 \$7,363.50	38000	U	1990	0	U 0	U 0	U 0			1	1				1 1	1	0	
Loomis, nanemann(1991,	,CA	02000000	ΦΖ,303.30	40000	U	1990	U	0	U	U	U	, 0			- 0	U			-	0	0.04101
Canada																					
Phillips,Haney(1993)	Canad	4076400	\$51.23	120000	0	1993	0	0	0	0	0	) 0	0	0	0	0	1	1 1	1	0	0 CVM
Vuuren,Roy(1993)	Canad	61935.62	\$126.01	741.3	0	1985	0	0	0	0	0	0 0	1	0	0	0	0	0 1	1	0	0 TCM
Vuuren,Roy(1993)	Canad	42083.6	\$171.24	370.65	0	1985	0	0	0	0	0	0 1	1	0	0	0		J 1	1	0	0 TCM
COURSE LISUCIALIZA	u topod		0.0127.00	- ara a' li									. 1								11111111

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





# 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 <u>Table</u> with <u>average values</u>

#### <u>Hunting Value Table</u>

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

converted to 2006 base year

Species Category	Ν	NORTHEAST	Ν	SOUTHEAST	Ν	INTERMOUNTAIN	Ν	PACIFIC	Ν	ALASKA	Ν	NATION
Big Game	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
Small Game	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
Waterfowl	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
AVERAGE, all game	е	\$42.28		\$88.61		\$62.88		\$93.20		\$62.82		\$129.81

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



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

Value o	of Hunting per H	lunter Day	
Instructions:	Fill in relevant cells marke	d "ENTER >" associated v	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 th	e value per day in output b	ОХ.
	See accompanying user r	nanual for detailed instruct	ions and documentation.
STEP 1	Enter a 1 next to the sit	e location: O otherwise	
	Enter a Thext to the sit	c location, o 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)
ETED 2.	Future 1 if land some og	hin in auchline O lifersternte	
STEP 2:	Enter a l'infand owners	mp is public; o il private	
	ENTER >	0	
STEP 3:	Enter BIG, SMALL or W	ATER in the apropriate c	ell(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.
	a Come TOTAL hunting	ቁስ ስስ	\$/ Hunter Day (2000 hass year)
	y Game/TOTAL nunung: DUT: Small Camai	\$0.00 \$0.00	φ numer bay (2000 base year) \$/ Hunter Day (2000 base year)
	rut: small Game:	\$U.UU \$51.10	p/ numer bay (2000 base year)
	IPUT: Watertowi:	\$01.18	n/ nunter day (2000 dase 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 Fill in relevant cells marked 'ENTER >" associated with acres of land and state income and population Instructions: 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 > NE acres: Federal Land 647,600 Cropland 19,469,200 820,000 Private Forest Land **Total Wetlands** 1.178.200 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) \$45,474 OUTPUT 0.29 State Migratory Bird Hunting Days / capita / year 500 ÷ # of state-wide 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 bird hunting ENTER > 1,774,571 (The 2007 value is filled in automatically; if you have more recent data, enter that into the cell) days from a 500acre wetland OUTPUT 512,043 State Total Migratory Bird Hunting Days / year STATE VALUES WITH MANAGEMENT/POLICY ACTION Enter the total state-wide number of acres of each type of land under the proposed project STEP 1a: 647,600 ENTER > Federal Land ENTER > 19,469,200 Cropland 826,000 Private Forest Land ENTER > 1,178,700 ENTER > **Total Wetlands** OUTPUT 512,075 Total Migratory Hunting Days / year for the site of interest CHANGE OUTPUT 32 Change in Total Migratory Bird Hunting Days / year

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





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

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

<u>Case A: Small open space</u>: 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 <sup>1</sup>/<sub>2</sub>-mile radius?



el	Property	value pr	remium est	imator model
pd	Instructions:	Fill in all cells	s marked "ENTE	ER >". (See accompanying user manual for detailed instructions and documentation.)
MC	STEP 1:	Select shap	e of area of ana	alysis in which property value premiums are analyzed
		ENTER >	С	Enter "C" for circular and "R" for rectangular shape of area
	STEP 2:	Enter the ra	adius (circular a	area) or length and width (rectangular area) of the area of analysis
nal		ENTER >	2640	Radius of area in feet
tin				
		OUTPUT:	503	Size of study area (acres)
	STEP 3:	Enter the si	ze of the open s	space
lu		ENTER >	50	Size in acres of the open space whose property value impact is to be estimated
/a		OUTPUT:	9.9	<b>%OSChange.</b> 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".
rty	STEP 4:	Enter the ap	opropriate value	es for the indicator variables
<b>)</b> 6]		ENTER >	1	FOR. Enter "1" if the open space is a forest. Otherwise, enter "0".
lo,		ENTER >	0	PARK. Enter "1" if the open space is a park. Otherwise, enter "0".
Pr		ENTER >	0	AG Enter "1" if the open space is agricultural land. Otherwise enter "0"
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<b>Open Space</b>	STEP 5:	ENTER > ENTER > P <sub>OS</sub> = Enter the n ENTER ( ENTER >	1 1 8.5 umber of reside 137 \$462,731	<ul> <li>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).</li> <li>PRIV. Enter "1" if the open space is privately owned. Otherwise, enter "0".</li> <li>% increase in average residential property value from open space of interest</li> <li>Intial properties located in the area</li> <li>Mumber of properties located in study area. NO</li> <li>Average value of properties (\$)</li> </ul>

#### **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?



	Property	value pr	emium estimato	or model
	Instructions:	Fill in all cell	ls marked "ENTER >".	(See accompanying user manual for detailed instructions and documentation.)
	STEP 1:	Select shap	be 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 r	adius (circular area) c	or length and width (rectangular area) of the area of analysis
		OUTPUT:	0	Size of study area (acres)
	STEP 3:	Enter the si	ize of the open space	
		ENTER >		Size in acres of the open space whose property value impact is to be estimated
			7.0	
		0011 01.	1.0	Example: A 20 percent share of open space in the area of interest is indicated as "20".
	STEP 4:	Enter the a	ppropriate values for	the indicator variables (see the Land Cover Definitions tab for how to code a particular land cover)
		ENTER >	1	FOR. Enter "1" if the open space is a forest. Otherwise, enter "0".
			0	<b>DARK</b> Enter "1" if the open space is a park. Otherwise, anter "0"
•		ENTER >	0	PARK. Enter 1 in the open space is a park. Otherwise, enter 0.
		ENTER >	0	<b>WET</b> . Enter "1" if the open space is a wetland. Otherwise, enter "0".
		ENTER >	0	<b>PROT</b> . Enter "1" if the open space is protected. Otherwise, enter "0". Protection is defined as the
		ENTER >	1	<b>PRIV.</b> Enter "1" if the open space is privately owned. Otherwise, enter "0".
1		$P_{os} =$	4.1	% increase in average residential property value from open space of interest
	STED 5.	Entor the n	umber of residential	
	STEP J.			
		ENTER >	339	Number of properties located in study area. NOTE: include only single-family nomes.
		ENTER >	\$140,157	Average value of properties (\$)
		OUTPUT:	\$1,963,428	Estimated total property premium in study area attributable to open space of interest

**Open Space Property Value Estimator Model** 

## 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
- = "Total" economic conservation value of site

![](_page_25_Picture_6.jpeg)

![](_page_25_Picture_7.jpeg)

# **SUMMARY OUTPUT MODEL**

• User enters data in individual model spreadsheets

• Selects values to include (hunting, wetlands, etc.) and valuation approaches (model/table) in Summary Output Model input fields

 Summary Output model compiles all model outputs in one place and displays the total value estimate

![](_page_26_Figure_4.jpeg)

# Toolkit also includes a "COMMUNITY ECONOMIC COMPETITIVENESS ANALYSIS"

- Reviews literature findings on impacts of conservation lands on county-level income, economic growth, output and employment

Findings of studies that focus specifically on local economic impacts of protected lands

Impact analyzed: N	Number ofstudies showing impact of conservation lands is								
<i>Change in</i>	Positive	Negative	Not significant						
Income/Output	6	0	2						
Employment	9	0	2						
Population	7	0	2						

#### Database: Database

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# 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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![](_page_29_Picture_7.jpeg)