

Forest Economics and Policy Working Paper #9802

**Measuring the Value of the Ecosystem in the Kushiro
Wetland: An Empirical Study of Choice Experiments**

Koichi KURIYAMA

*Department of Forest Science
Faculty of Agriculture
Hokkaido University,
Kita 9, Nishi 9, Sapporo, 060, JAPAN*

TEL +81 11 706 3342

FAX +81 11 706 2527

E-mail kuri@for.agr.hokudai.ac.jp

February 1998

Draft

ABSTRACT

This paper estimates the environmental value of the ecosystem in the Kushiro wetland using data from choice experiments (CE). CE asks individuals to pick from a set of resource management alternatives. The results are as follows: (1) The average willingness to pay is 16,414 yen/year/household and the aggregate willingness to pay is 36 billion yen/year, when all the land around the wetland (151,361 ha) is protected for the ecosystem. (2) Cost benefit analysis shows that the optimal protection area is in the range between Q_4 (91,361 ha) and Q_5 (151,361 ha). This means that it is important in terms of social welfare to protect not only the wetland itself, but also the forest around the wetland. (3) The internal scope insensitivity hypothesis is rejected.

Keywords

conjoint analysis, choice experiment, wetland ecosystem, environmental valuation

1. ENVIRONMENTAL VALUATION AND CHOICE EXPERIMENTS

Kushiro Wetland National Park in Hokkaido, Japan covers 26,861 ha. It is an important habitat for about 1,400 species of animals, 170 species of birds, 1,150 species of insects, and 600 species of plants. This wetland has been declared internationally significant under the Ramsar Convention of 1980. Over 600,000 people visit the wetland annually, and other recreational resources have been developed around the wetland. For example, 18 golf courses are planned or under development. Some people living in the Kushiro area are concerned about the environmental effects of these recreational resources on animal habitats. Therefore, conflicts have arisen between nature conservationists and resource developers in the Kushiro wetland.

This paper measures the environmental value of the ecosystem in the Kushiro wetland using choice experiments (CEs). The CE technique is a type of multi-attribute preference-elicitation technique widely used in marketing research, transportation, and psychometrics (Louviere, 1988 and 1994). Table 1 shows the overview of stated preference elicitation methods. In the field of environmental economics, contingent valuation (CV) has traditionally been used to estimate the value of environmental resources (Carson et al., 1995).

Choice experiments are a type of conjoint analysis. Respondents are asked to choose their most preferred profile of attributes from a group of profiles. For example, when evaluating preference in new cars, respondents are given several cards, each of which shows a unique car composed of specific attributes, such as color, size, price, and so on. When evaluating preferences in natural resources, these cards show resource management alternatives. CEs can estimate the value of the alternatives that are described by the attributes.

TABLE 1. Stated Preference Approach and Choice Experiment

Previous conjoint analysis studies for environmental valuation include Viscusi et al. (1991, health risk; pair-comparison), Mackenzi (1993, hunting; pairwised RBC), Opranch et al. (1993, hazardous waste; pairwised RBC), Adamowicz et al. (1994, recreation; CE), Johnson and Desvousges (1997, electronic site; pairwised RBC), Griner and Faber (1996a, b, water resource; pairwised RBC), Boxall et al. (1996, hunting; CE), Roe et al. (1996, salmon-fishing; RBC), Adamowicz et al. (1997, hunting; CE), and Adamowicz et al. (1995; 1998, habitat protection; CE).

Contingent ranking asks respondents to rank a set of alternatives in order of

preference, rather than to choose their most preferred alternative. Previous contingent ranking studies include Beggs et al. (1981, electric cars), Rae (1983, visibility), Smith and Desvouges (1986, water recreation), Lareau and Rae (1989, diesel odor fumes), Doane et al. (1988), Hartman et al. (1991, electric reliability), Brown et al. (1994, northern spotted owl), Schulze et al. (1993, alternative fueled vehicles), Layton (1995, 1996, Superfund hazardous waste site cleanup), Kuriyama (1997, watershed management), and Kaoru and Yasuda (1998, water quality).

There are many studies of the environmental valuation of wetland preservation, including Thibodeau and Ostro (1981, Hedonic Method and CV), Farber and Costanza (1987, Travel Cost Method and CV), Farber (1988, Travel Cost Method and CV), Whitehead and Blomquist (1991, CV), Hanemann et al. (1991, CV), Sappideen (1992, CV), Stone (1992, CV), and Kuriyama (1996, CV)

2. MODEL

Let the indirect utility function of individual i be $U_i(q, M)$, where q is environmental quality, and M is income. Assume that the individual faces the alternative set $A(\mathbf{q}, \mathbf{T}_i)$, where $\mathbf{q} = q_1, \dots, q_m$ is the vector of environmental quality, and $\mathbf{T}_i = T_{i1}, \dots, T_{im}$ is the vector of payment. When the individual i chooses the alternative j , his or her payment is T_{ij} .

Assume that the indirect utility function is the following:

$$\begin{aligned} U_{ij} &= V_{ij} + \varepsilon_{ij} \\ &= V_i(q_j, M - T_{ij}) + \varepsilon_{ij} \end{aligned} \quad (1)$$

where U_{ij} is the total utility that the individual i receives from the alternative j , V_{ij} is the observable component of the total utility, and ε_{ij} is the unobservable component. The price vector is omitted, since prices are assumed to be constant. Then the probability P_{ij} that the alternative j is chosen by individual i is

$$\begin{aligned} P_{ij} &= \Pr(U_{ij} > U_{ik}, \forall k \in \mathbf{C}) \\ &= \Pr(V_{ij} - V_{ik} > \varepsilon_{ik} - \varepsilon_{ij}, \forall k \in \mathbf{C}) \\ &= \int_{-\infty}^{V_{ij} - V_{i1}} \int_{-\infty}^{V_{ij} - V_{i2}} \dots \int_{-\infty}^{V_{ij} - V_{im}} f(\tilde{\varepsilon}_1, \tilde{\varepsilon}_2, \dots, \tilde{\varepsilon}_m, \Omega) d\tilde{\varepsilon}_m d\tilde{\varepsilon}_{m-1} \dots d\tilde{\varepsilon}_1 \end{aligned} \quad (2)$$

where $\tilde{\varepsilon}_k = \varepsilon_{ik} - \varepsilon_{ij}$ is an error difference, Ω is the covariance matrix, and $f(\bullet)$ is the joint density of error differences.

McFadden (1974) showed that if the error terms in equation (2) are independently and identically distributed with a type I extreme-value distribution (a Gumbel distribution), then the choice probability, P_{ij} , has the closed-form representation

$$P_{ij} = \frac{e^{\lambda V_{ij}}}{\sum_k e^{\lambda V_{ik}}} \quad (3)$$

where λ is the scale parameter, conventionally normalized to 1. McFadden's model is known as the conditional logit model.

3. SURVEY DESIGN

The data comes from a choice experiment survey conducted on the general public in Sapporo, Japan. This was a mole-intercept survey. The sample included residents and visitors. We initially conducted a small sample, pre-test survey, which we then modified in terms of the expression of the question and the range of the bid.

We prepared 5 alternative proposals for the protection of the Kushiro wetland ecosystem (Table 2 and Figure 1). The CE question was as follows:

Let us assume the following 5 environmental proposals for the protection of the Kushiro wetland ecosystem, and that your choice affects which proposal is chosen. Which do you prefer?

Table 2: Proposed Alternatives for The Protection of the Wetland Ecosystem

Figure 1. Map of the Protected Area

The range of T is between ¥0 and ¥96,500. We prepared 15 versions of the payment mechanism (Table 3).

Table 3 Payment Mechanism

4. RESULTS

We conducted a mole-intercept survey on the general public in Sapporo. The total sample surveyed was 845. While 81% of the respondents knew of the wetland, only 36% of the respondents had been to the Kushiro wetland. The protest bid was 71 and the valid sample for the choice experiment was 670.

We assume that the indirect utility function is the following:

$$V_{ij} = \beta_T T_{ij} + \beta_{\log Q} \log(Q_j) \quad (5)$$

where β is the set of parameters. Next, consider the estimation of the welfare of the conservation of the wetland ecosystem. The total differential of the utility function (5) is

$$\begin{aligned} dV_{ij} &= \frac{\partial V_{ij}}{\partial T_{ij}} dT_{ij} + \frac{\partial V_{ij}}{\partial Q_j} dQ_j \\ &= \beta_{\text{COSR}} dT_{ij} + \beta_{\log Q} \frac{1}{Q_j} dQ_j \end{aligned} \quad (6)$$

where utility is assumed to be held constant ($dV_{ij}=0$). The monetary measure for 1 unit change of preservation area is

$$\frac{dT_{ij}}{dQ_j} = -\frac{\beta_{\log Q}}{\beta_T} \frac{1}{Q} \quad (7)$$

Then, the compensating surplus (CS) or willingness to pay (WTP) for the change from Q_1 to Q_j is

$$\begin{aligned} WTP_j &= \int_{Q_1}^{Q_j} \left[-\frac{\beta_{\log Q}}{\beta_T} \frac{1}{Q} \right] dQ \\ &= \frac{\beta_{\log Q}}{\beta_T} (\log Q_1 - \log Q_j) \end{aligned} \quad (8)$$

To check the validity of the estimated results, scope tests are used in many contingent valuation studies. A scope test looks at whether respondents are willing to pay more for a good that is of high quality or quantity. Kahnemann and Knetsch (1992)

show that respondents to contingent valuation surveys do not give different values to goods which differ in scope . Carson et al. (1996) argue that failure to pass a scope test can be attributed to one of three factors: (1) lack of statistical power used to detect the difference in value, (2) problems in contingent valuation survey design, or (3) contingent valuation survey results that violate economic theory. Carson (1997) shows that 31 studies reject the scope insensitivity hypothesis while 4 do not, and concludes that these 4 studies tend to suffer from small sample size or poor survey design.

In this model, I test internal scope insensitivity by looking at the following hypothesis.

$$\text{Internal scope insensitivity hypothesis: } \beta_{\log Q}=0$$

From expression (8), if $\beta_{\log Q}$ is equal to 0, then the WTPs are not affected by the change of Q . Thus, when the scope insensitivity hypothesis cannot be rejected, we conclude that this model may be inconsistent with economic theory or the survey design may be flawed.

Table 4 shows the results of the conditional logit models. These models were estimated by the maximum likelihood method using LIMDEP. The pseudo R^2 is one of the goodness-of-fit measures and it is defined to be

$$\text{Pseudo}R^2 = 1 - \frac{LL_u}{LL_r}$$

where LL_u is the log likelihood of the estimated model and LL_r is the log likelihood of the model when all of the coefficients are restricted to be zero.

The parameter $\beta_{\log Q}$ is 1.2168 and it is strongly significant at $p < 0.001$. Thus the internal scope insensitivity hypothesis is strongly rejected.

Table 4 Results of The Conditional Logit Analysis

Table 5 shows the estimated willingness to pay for protecting a larger area of the wetland ecosystem. The 95% confidence intervals of WTPs are calculated by Krinsky and Robb (1986) in a procedure that utilizes the repeated random draws of the

Diamond et al. (1993), Desvousges et al. (1993), and Schkade and Payne (1994) show the same results.

coefficient vectors from the covariance matrix. The aggregate WTP is estimated by multiplying the average WTP by the number of households in Hokkaido.

Table 5 The Estimated WTPs of Wetland Ecosystem Protection

Figure 2 illustrates the net-benefit of protection for the wetland ecosystem. The net-benefit is estimated by the aggregate WTP and the cost of protection. The cost includes the rents paid for timber lands, farm lands, and industrial lands. These rents are estimated by multiplying the land prices by the discount rate (0.05). The costs of forest management or the reduction of agricultural wastes are omitted.

FIGURE 2 Net-Benefit of the Protection for the Ecosystem in Kushiro

The optimal protection on the grounds of economic efficiency is in the range between Q_4 and Q_5 . Thus, it is important in terms of social welfare to protect not only the wetland itself, but also all of the forest around the wetland.

5. DISCUSSION

This paper discussed the environmental valuation of the ecosystem in the Kushiro Wetland using the choice experiment method. Since the Kushiro Wetland was specified in the Ramsar Convention list and became a national park, the number of visitors has increased rapidly, and resort developments have sprung up around the wetland. However, it is difficult to regulate recreational use and resort development under the National Park system in Japan. The main purpose of the National Park Service is to protect the scenery, rather than to protect the ecosystem. Furthermore, it is impossible to regulate land use outside the national park. The conservation of the upper basin, such as the riparian area, is very important for this wetland, because the developments in the upper area may effect the wetland ecosystem. However, land use in the upper area cannot be regulated because it is outside the national park.

Our results show that the ecosystem of the Kushiro wetland is of a very high value, and it is essential to preserve not only the national park but also the upper basin

The data sources of these prices are “The Price of Forest Land and Stumpage”, “The Price of Farm Lands and Farm Rents” (Nihon Fudosan Kenkyujo), and “Local Economic Data” (Toyo Keizai).

forest area. At present, land use around the Kushiro wetland is managed by many government agencies. The forest area of the upper basin is managed by the Forest Agency, the agricultural land around the wetland is managed by the Ministry of Agriculture, Forestry and Fisheries and the wetland area, where specified to be within the national park, is managed by the Environment Agency. This multi-agency management system promoted development without an integrated land management plan. An integrated ecosystem management plan must be made for land use around this wetland.

REFERENCES

- Adamowicz W, Louviere J and Williams M (1994) Combining Revealed and Stated Preference Methods for Valuing Environmental Amenities. *Journal of Environmental Economics and Management*, 26: 271-292
- Adamowicz W, Boxall P, Williams M and Louviere J (1995) Stated Preference Approaches for Measuring Passive Use Values: Choice Experiment versus Contingent Valuation. Rural Economy Staff Paper 95-03. Department of Rural Economy, University of Alberta.
- Adamowicz W, Swait J, Boxall P, Louviere J and Williams M (1997). Perception versus Objective Measures of Environmental Quality in Combined Revealed and Stated Preference Models of Environmental Valuation. *Journal of Environmental Economics and Management*, 32(1): 65-84
- Adamowicz, W, Boxall P, Williams M and Louviere J (1998) Stated Preference Approaches for Measuring Passive Use Values: Choice Experiment versus Contingent Valuation. Forthcoming. *American Journal of Agricultural Economics*.
- Begges S, Cardell S and Hausman J (1981) Assessing The Potential Demand for Electric Cars. *Journal of Econometrics*, 16: 1-19.
- Blomquist GC and Whitehead JC (forthcoming) Resource Quality Information and Validity of Willingness to Pay in Contingent Valuation. *Resource and Energy Economics*.
- Brown G, Layton DF and Lazo J (1994) Valuing Habitat and Endangered Species. Discussion Paper 94-1, University of Washington.
- Carson, RT (1997) Contingent Valuation Surveys and Tests of Insensitive to Scope. In: Kopp RJ, Pommerehne WW and Schwarz N (eds) *Determining the Value of*

Non-Marketed Goods, Economic, Psychological, and Policy Relevant Aspects of Contingent Valuation Methods. Kluwer Academic Press, pp 127-163.

Carson RT, Wright JL, Carson N, Alberini A and Flores N (1995). A Bibliography of Contingent Valuation Studies and Papers. Natural Resource Damage Assessment, Inc., CA. San Diego.

Carson RT, Flores NE and Meade NF (1996) Contingent Valuation: Controversies and Evidence. Discussion Paper San Diego: Department of Economics, University of California, San Diego.

Desvousges WH, Johnson FR, Dunford RW, Boyle KJ, Hudson SP and Wilson KN (1993) Measuring Natural Resources Damages with Contingent Valuation: Tests of Validity and Reliability. In: Hausman JA (eds) Contingent valuation: A critical assessment, Contributions to Economic Analysis, vol 220, Amsterdam: North-Holland, pp 91-159

Diamond PA, Hausman JA, Leonard GK and Denning MA (1993) Does Contingent Valuation Measure Preferences? Experimental Evidence. In: Hausman JA (eds) Contingent valuation: A critical assessment, Contributions to Economic Analysis, vol 220, Amsterdam: North-Holland, pp 41-85

Doane MJ, Hartman RS and Woo CK (1988) Household Preference for Interruptible Rate Options and Revealed Value of Service Reliability. *The Energy Journal*, 9(0): 121-134

Farber S. (1988) The Value of Coastal Wetlands for Recreation: an Application of Travel Cost and Contingent Valuation Methodologies. *Journal of Environmental Management*, 26: 299-312

Farber S and Costanza R (1987) The Economic Value of Wetlands Systems. *Journal of Environmental Management*, 24: 41-51

Griner BP and Farber SC (1996a) A Conjoint Analysis of Water Quality Enhancements and Degradations in a Western Pennsylvania Watershed. Watershed '96 Conference Paper, Water Environment Federation, Baltimore MD.

Griner BP and Farber SC (1996b) Valuing Watershed Quality Enhancements using Conjoint Analysis. Fourth Biennial Meeting of the International Society of Ecological Economics, Conference Paper, Boston, MA.

Hanemann M, Loomis J and Kanninen B (1991) Statistical Efficiency of Double-Bounded Dichotomous Choice Contingent Valuation. *American Journal of Agricultural Economics*, 73(4): 1255-1263

Hanemann WM and Kanninen B (forthcoming) The Statistical Analysis of Discrete-Response CV Data. In Bateman IJ and Willis KG (eds) *Valuing*

- Environmental Preferences: Theory and Practice of the Contingent Valuation Method in the US, EC, and Developing Countries, Oxford University Press.
- Hartman RS, Doane MJ and Woo CK (1991) Consumer Rationality and the Status Quo. *Quarterly Journal of Economics*, 106(1): 141-162
- Johnson FR and Desvousges WH (1997) Estimating Stated Preferences with Rated-Pair Data: Environmental, Health, and Employment Effects of Energy Programs. *Journal of Environmental Economics and Management*, 34(1): 79-99
- Kahneman D and Knetsch JL (1992) Valuing Public Goods: The Purchase of the moral satisfaction. *Journal of Environmental Economics and Management*, 22: 57-70
- Kaoru Y and Yasuda G (1997) Valuing Water Quality Improvements for Lake Biwa-Yodo River: A Contingent Ranking Analysis. Paper prepared for presentation at the annual meeting of Association of Environmental and Resource Economists, January 3-5, 1998, Chicago, IL.
- Krinsky I and Robb AL (1986) On Approximating the Statistical Properties of Elasticities. *Review of Economics and Statistics*, 68: 715-719
- Kuriyama K (1996) Environmental Valuation of the Landscape in Kushiro Wetland (in Japanese). *Journal of Forest Economics*, 129: 45-50.
- Kuriyama K (1997) The Estimation of Public Demand for the Forest Management: Contingent Ranking Study (in Japanese). *Forest Economics and Policy Working Paper*, Department of Forest Science, Hokkaido University, Sapporo, Japan.
- Lareau TJ and Rae DA (1989) Valuing WTP for Diesel Odor Reductions: An Application of Contingent Ranking Technique. *Southern Economic Journal*, 55(3): 728-742
- Layton DF (1995) Specifying and Testing Econometric Models for Stated Preference Surveys. Ph.D. dissertation, Department of Economics, University of Washington, Seattle.
- Layton DF (1996) Rank Ordered, Random Coefficients Multinomial Probit Models for Stated Preference Surveys: An Investigation of Preference Heterogeneity, IIA, and Contingent Ranking Data. Paper presented 1996 AERE Workshop, Tahoe City, California.
- Louviere JJ (1988) Analyzing Decision Making: Metric Conjoint Analysis. Series: Quantitative Applications in the Social Sciences, No.67, SAGA Publications.
- Louviere JJ (1994) Conjoint Analysis in *Advances in Marketing Research* edited by R. Bagozzi, Cambridge, Blackwell Publishers, pp 223-259

- MacKenzie J (1993) A Comparison of Contingent Preference Models. *American Journal of Agricultural Economics*, 75: 593-603
- McFadden D (1974) Conditional Logit Analysis of Qualitative Choice Behavior. In Zarembka P (eds) *Frontiers in Econometrics*, Academic Press, pp 105-142
- Menkhaus S and Lober DJ (1996) International Ecotourism and the Valuation of Tropical Rainforests in Costa Rica. *Journal of Environmental Management*, 47(1): 1-10
- Oprauch JJ, Swallow S, Weaver T, Wessels T and Wichlens D (1993) Evaluating impacts from noxious waste facilities: including public preferences in current siting mechanisms. *Journal of Environmental Economics and Management*. 24: 41-59
- Roe B, Boyle KJ and Teisl MF (1996) Using Conjoint Analysis to Derive Estimates of Compensating Variation. *Journal of Environmental Economics and Management*, 31(2): 145-159
- Rae DE (1983) The Value to Visitors of Improving Visibility at Mesa Verde and Great Smoky National Parks. In Rowe RD and Chestnut LG (eds) *Managing Air Quality and Scenic Resources at National Parks*, Westview Press, Boulder, CO.
- Sappideen B (1992) Valuing the Recreation Benefits of Sale Wetlands using Contingent Valuation. In Lockwood M and DeLacy T (eds), *Valuing Natural Areas: Applications and Problems of the Contingent Valuation Method*, Johnstone Center of Parks, Recreation and Heritage, Charles Sturt University, Albury, pp 39-46
- Schkade DA and Payne JW (1994) How People Respond to Contingent Valuation Questions: A Verbal Protocol Analysis of Willingness to Pay for an Environmental Regulation. *Journal of Environmental Economics and Management*, 26: 88-109
- Smith VK and Desvougues WH (1986) *Measuring Water Quality Benefits*. Kluwer-Nijhoff Publishing, Boston.
- Stone A (1992) Contingent Valuation of the Barmah Wetlands, Victoria. In Lockwood M and DeLacy T (eds), *Valuing Natural Areas: Applications and Problems of the Contingent Valuation Method*, Johnstone Center of Parks, Recreation and Heritage, Charles Sturt University, Albury, pp 47-70
- Thibodeau FR and Ostro BD (1981) An Economic Analysis of Wetland Protection. *Journal of Environmental Management*, 12: 19-30
- Viscusi WK, Magat WA and Huber J. (1991) Pricing Environmental Health Risks:

Survey Assessments of Risk-Risk and Risk-Dollar Trade-Offs for Chronic Bronchitis. *Journal of Environmental Economics and Management*, 21: 91-96

Whitehead JC and Blomquist GC (1991) Measuring Contingent Values for Wetlands: Effects of Information about Related Environmental Goods. *Water Resources Research*, 27(10): 2523-2531

TABLE 1. Stated Preference Approach and Choice Experiment

Stated Preference Approach	
contingent valuation (CV) single-attribute preference-elicitation	Asks respondents their willingness to pay or willingness to accept compensation
conjoint analysis (CA) multi-attribute preference-elicitation	
rating-based conjoint (RBC)	Asks respondents their preference on the rating scale (say, 1-9)
choice experiment (CE) or choice-based-conjoint (CBC)	Asks respondents their most preferred alternative
contingent ranking (CR)	Asks respondents to rank order of alternatives

Table 2 The Protection Alternatives of the Wetland Ecosystem

No	Description	Payment
1	status-quo	T _{i1}
2	Additional protection of the wetland outside the National Park	T _{i2}
3	Additional protection of the forest around the rivers and lakes	T _{i3}
4	Additional protection of all forest around the wetland	T _{i4}
5	Additional protection of all land around the wetland	T _{i5}

Table 3 Payment Mechanism

yen / year / household

No	T ₁	T ₂	T ₃	T ₄	T ₅
1	0	20	100	300	600
2	0	40	200	500	1,000
3	0	60	300	800	1,500
4	0	80	400	1,000	1,900
5	0	100	600	1,500	2,900
6	0	100	800	2,000	3,900
7	0	200	1,100	3,000	5,800
8	0	300	1,900	5,000	9,700
9	0	600	3,000	8,000	15,400
10	0	700	3,800	10,000	19,300
11	0	1,000	5,700	15,000	29,000
12	0	1,400	7,600	20,000	38,600
13	0	2,100	11,400	30,000	57,900
14	0	2,800	15,200	40,000	77,200
15	0	3,500	19,000	50,000	96,500

Table 4 The Result of Conditional Logit Analysis

Variable	Coefficient	t statistics	P-Value
T	-0.00012817	-11.613	0.000
LogQ	1.2168	12.622	0.000
Log likelihood	-928.1694		
n	670		
Pseudo R ²	0.1386		

Table 5 The Estimated WTPs of Wetland Ecosystem Protection

Q	Mean WTP	aggregate WTP	management cost	net benefit	
(ha)	(yen/year/household)	(billion yen / year)			
Q1	26,861	0 [0 - 0]	0	0	
Q2	31,361	1,470 [1,299 - 1,699]	3.2	0.7	2.5
Q3	51,361	6,154 [5,436 - 7,112]	13.6	0.9	12.7
Q4	91,361	11,622 [10,267 - 13,431]	25.6	1.3	24.3
Q5	151,361	16,414 [14,501 - 18,970]	36.1	11.7	24.3

The numbers in brackets are 95% confidential intervals which are obtained by the method of Krinsky and Robb (1986) and based on 1000 random draws.

FIGURE 1. Map of the Protected

