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Revegetation of Regent Honeyeater habitat in the Capertee Valley: a Cost-Benefit Analysis

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Abstract

This study considers the costs and benefit of the Regent Honeyeater Project in the Capertee Valley over the past 10 years. The benefits are estimated using choice modelling and the costs are based on project expenditure and forgone agricultural production. A comparison of the benefits and costs yields a benefit-cost ratio (BCR) of 4.45, which implies that the benefits outweigh the costs. However, variation in the underlying assumptions reveal significant sensitivity to the uncertainty associated with the maturation of native tree plantings and the successful establishment of a significant population of birds within the native vegetation. The Cost Benefit Analysis (CBA) is dominated by the benefit derived from protection of the native species (i.e. the Regent Honeyeater) which in turn depends on these two uncertainties. By expanding the total area of land being revegetated and reducing the fragmentation amongst individual plantings these uncertainties can be reduced. This should deliver larger benefits and further improve the BCR.

Key words: Cost-benefit analysis, Benefit-cost ratio, Choice modelling, Regent Honeyeater, Capertee Valley.

1. Introduction

The Regent Honeyeater (*Xanthomyza phrygia*) is listed as endangered both nationally and in New South Wales (NSW) with the population currently estimated to be less than 2000 (Department of the Environment, 2009; DECCW, 2005b). Though the Regent Honeyeater was once found from Adelaide to the central coast of Queensland, sightings are now largely confined to three key areas which act as breeding habitat for the species: Bundarra-Barraba and the Capertee Valley in NSW; and Chiltern-Albury in Victoria (DECCW, 2005b). The main threat to the species is the decline of its natural habitat - Box-Ironbark and other temperate woodlands and riparian gallery forest dominated by River She-oak - mainly due to land clearing for agriculture and residential development (DECCW, 2005b).

Birds Australia, through the Capertee Valley Regent Honeyeater Operations Group has been undertaking a project in the Capertee Valley to aid the recovery of the regent honeyeater. This project has had significant input from the threatened species unit of the NSW Department of Environment, Climate Change and Water (DECCW) and has received funding from numerous sources. In recent years, the Hawkesbury-Nepean Catchment Management Authority (CMA) has been the major supporter using funds from the Natural Heritage Trust and Caring for Our Country programs. The project, which has been ongoing for more than 10 years, aims to achieve its goal by planting native tree species with the assistance of private landowners and volunteers. Plantings are held twice a year and maintenance carried out by landholders or additional volunteer weekends (B. Dixon, personal communication, September 16, 2010).

The aim of this study is to compare the costs and benefits of the Regent Honeyeater Project in an economic analysis. To do this, the study makes use of the cost-benefit analysis (CBA) methodology including the use of choice modelling (a non-market environmental valuation method) to provide estimates of the project benefits from 2000 to 2009 - the period during which most project activity has taken place.

2. Background

2.1 Cost-Benefit Analysis

The aim of CBA is to inform decision-makers about the social benefits of a particular investment. Ultimately the best outcome would be the one which facilitates the most efficient allocation of society's resources (Boardman et al., 2006: 2). In order to do this one must review all possible costs and benefits associated with alternative investments. The investment for which the benefits outweigh the costs by the greatest margin is the preferable option. The benefit-cost ratio (BCR) is used as a measure to determine the efficiency of the investment.

It may appear unusual to consider the protection of an endangered species in economic terms but it is important to remember that the economic valuation of environmental and social benefits is intended to enable comparison of the different costs and benefits (Hanley & Barbier, 2009: 15). Estimating a monetary value for the protection of a species does not necessarily imply that it is a product to be traded through the creation of a market for it[1]. Rather, the environmental asset is valued in dollar-terms simply because this is the unit commonly used for investment decisions and allows comparison across the different costs and benefits.

2.2 Choice Modelling

Choice modelling (CM) is a 'stated preference' technique which is used in this study to estimate the non-market environmental benefits of the project. People's preferences are determined by asking them questions about alternative natural resource management investment options. The outcomes of the options are presented to survey respondents in the form of 'choice sets'. Attributes are used to describe each outcome and the level of each attribute is varied to distinguish the different management options. The data to construct the economic model of peoples' preferences are gathered when respondents make choices between the different outcomes thereby revealing their preference for the outcome attributes.

Recent work by Mazur and Bennett (2009) within the Hawkesbury-Nepean Catchment has led to the development of such an economic model. It allows the estimation of the benefits that NSW households would derive from the protection of native vegetation and native species. An important advantage of this work is that it offers decision-makers in NSW a way to estimate the

[1] 'Black markets' for protected species do exist in parts of the world.

benefit of investing in environmental improvements. Often there is little information available on the extent of the benefits of investing in environmental assets. As a result the value to the public is often not included in analyses because it is too difficult to put a dollar-value on the benefit of having the environmental asset protected. This CM study allows one to estimate the dollar-value of investments such as the Regent Honeyeater Project.

The concept of an attribute and its levels is at the heart of CM to determine benefit estimates. Attributes refer to the 'characteristics' of potential projects' outcomes as they are presented to respondents during the survey. Four attributes were used in this CM study: native vegetation, native species, healthy waterways and agricultural employment. However, in this CBA only the native vegetation and native species attributes are relevant and benefit estimates are therefore only derived for these two attributes.

The benefit that NSW households derive from each attribute is characterised by its implicit price. Estimates for the net present values of the implicit prices are displayed in table 1. Benefit estimates are calculated from the implicit prices for the attributes by multiplying each implicit price with the level of the attribute, the number of households and the response rate; and then aggregating the values for the three regions. Payments are to be made annually over a period of five years.

Table 1: Implicit prices for the CM attributes

Attribute	**Units**	**Hawkesbury-Nepean**	**Sydney**	**Rural NSW**
Native Vegetation	$ per sq. km. per household p.a.	-	0.26	-
Native Species	$ per species per household p.a.	30.18	22.73	21.52
Healthy Waterways	$ per km. per household p.a.	3.90	4.76	3.64
Agricultural Employment	$ per person per household p.a.	1.00*	-	-

*Significant only at the 10 per cent level.
All values discounted at a rate of 5 per cent over 5 years.

3. Cost-Benefit Analysis

3.1 Benefits

A CBA can be broadly classified as either *ex ante* or *ex post* depending on whether it is being done before or after the investment. This CBA is both *ex post* and *ex ante*. It considers the costs arising over the past 10 years of the project but because many of its benefits are yet to be realised, it also includes future benefits. One of the challenges facing an *ex ante* CBA is the uncertainty associated with future events. The way that this uncertainty is usually addressed is to weight the benefit by the probability of that benefit being realised (Hanley & Barbier, 2009: 36; Campbell & Brown, 2003: 198).

The aggregate benefit of the project is composed of the benefit derived from the establishment and protection of native vegetation and native species. The uncertainty to which these benefits are subject can be represented by probabilistic factors in the calculation of the aggregate benefit (AB):

$$AB = (P_{NV} \times B_{NV}) + (P_{NV} \times P_{NS} \times B_{NS}) \qquad (1)$$

where P_{NV} ≡ Probability of success in establishing the area of plantings as native vegetation;

B_{NV} ≡ Estimated benefit derived from the protection of the corresponding area of native vegetation;

P_{NS} ≡ Probability of assuring the protection of the native species for the particular project;

B_{NS} ≡ Estimated benefit derived from the protection of that native species.

3.1.1 Benefit derived from establishment of native vegetation

This benefit is dependent on the area of native vegetation which becomes successfully established. Due to the fact that this CBA considers work which has happened over the past 10 years, the area over which plantings have been successfully established is relatively certain. The different areas of plantings have suffered from a number of detrimental impacts (drought, salinity, damage from fauna, etc.) but some areas have also benefited from replanting (B. Dixon, personal communication, September 16, 2010). Overall the survival rate to date range between 50 and 90 per cent for most of the 90 hectares (0.90 square kilometres) of plantings. Therefore, using the implicit prices from table 1 the corresponding benefit estimates for the native vegetation attribute are as illustrated in table 2.

Table 2. Survival rates and corresponding native vegetation benefit estimates.

Survival rate	**Area (square km)**	**Benefit estimate (B_{NV})**
50 %	0.45	$47,173
60 %	0.54	$56,606
70 %	0.63	$66,041
80 %	0.72	$75,475
90 %	0.81	$84,910

The CM study described this attribute as the "area of native vegetation in good condition" (Mazur and Bennett, 2009: 27). Respondents had to consider the area of land which would be returned to good condition in 20 years time. The planting program targeted native species. Mainly *Eucalyptus sideroxylon*, *E.albens*, and *E. melliodora* have been planted along with a range of other species in lower numbers in order to conform to the composition of the surrounding remnant vegetation (Lollback 2008, p.4). The last two species are associated with Box-Gum Woodlands, which are listed as endangered ecological communities in NSW (DECCW 2005a). Once mature, the revegetated areas should conform to the native vegetation attribute in the CM study used to estimate the benefit that NSW households derive from the protection of native vegetation.

However, in the mean time the uncertainty associated with the future maturation of the plantings should be reflected in the probability of success in establishing the area of plantings as native vegetation as expressed by the probability factor P_{NV} in equation 1. Some of the factors which may impact on the maturation of forests include:

- The time required for trees to develop sufficient hollows which may act as nesting sites for birds (Lollback, 2008: 22).
- Clearance of woodland habitat (Department of the Environment, 2009).
- Lack of regeneration in existing woodlands due to animal grazing (Department of the Environment, 2009).
- Removal of firewood affecting the health of the forest ecosystem (Department of the Environment, 2009).
- Invasion by non-native plant and animal species (DECCW, 2005a).

3.1.2 Benefit derived from the protection of native species

The native species attribute is described in the questionnaire as "the number of species protected" in the catchment in 20 years time (Mazur and Bennett, 2009: 27). In order to achieve this for the Regent Honeyeater the project would firstly have to establish native vegetation on the targeted land to act as bird habitat and secondly would have to establish a bird population within the habitat to secure the protection of the species. These two types of uncertainties are reflected in the two probability factors P_{NV} and P_{NS} in the second term of equation 1. As mentioned above, once established, plantings face a further period of maturation in order to be considered native vegetation. This is especially true when considering the plantings as a potential habitat for the species in question.

Factors which may impact on the successful establishment of a thriving community of regent honeyeaters include:

- Competition with other species (DECCW 2005b), in particular 'edge-species' such as the noisy miner coupled with the fractured nature of the Capertee plantings (Lollback, 2008).
- The high mobility of this migratory species (Department of the Environment, 2009)
- Maturity of its natural woodland habitat which include large numbers of mature trees, high canopy cover and an abundance of mistletoe. For example, new regent honeyeater communities have been identified in woodlands which favoured tree species such as Mugga Ironbark and Yellow Box 20 years after planting (DECCW 2005b).
- Lack of understanding of the migratory patterns of the species (DECCW 2005b).

Lollback (2008: 24) suggests that the small size and fractured nature of the plantings mean that they may be viewed as "transitional zones between matrix and remnant vegetation". Furthermore, he concluded that the Capertee plantings were probably still too young to be effective as a habitat for the regent honeyeater, though the presence of other species such as the black-chinned honeyeater and the painted honeyeater suggested that the older plantings were close to the required maturity. In order to ensure species survival it may be necessary to establish further plantings in order to not only cover a greater area with habitat for the birds but to also ensure greater connectivity amongst the isolated patches of forest. This should reduce the impact that the presence of edge-dwellers such as noisy miners has on the regent honeyeater. The uncertainty associated with the eventual establishment and growth in numbers of the regent honeyeater populations within the Capertee valley is represented by a second probability factor, P_{NS}.

The benefit estimate (B_{NS}) for the protection of a species in the Hawkesbury-Nepean is calculated as $23.55 million based on the implicit prices for the native species attribute (see table 1), number of households and the response rates for the various regions.

3.1.3 Aggregate Benefit Calculation

The values of P_{NV} and P_{NS} are assumed to be 50 per cent. These assumptions are based on the fact that the plantings still face further maturation and Lollback (2008) observed no Regent Honeyeaters in the plantings as yet. Thus the aggregate benefit can be calculated from equation 1 as:

AB = (0.5 x $ 0.066 million[2]) + (0.5 x 0.5 x $23.55 million) = $5.92 million

Note that the overall contribution of the native vegetation attribute to the aggregate benefit is small relative to the native species attribute. This is due to the small size of the area targeted for planting (less than one square kilometre).

3.2 Costs

The aggregate cost (AC) is the sum of the costs incurred over the life of the project and discounted to the present value (PV) as summarised in equation 2.

$$AC = PV_{MC} + PV_{LC} + PV_{FA} \qquad (2)$$

where PV_{MC} ≡ Present value of material costs;

PV_{LC} ≡ Present value of labour costs;

PV_{FA} ≡ Present value of foregone agricultural income.

The PVs are calculated as an annuity which is compounded at an interest rate of 5 per cent and aggregated over the period from 2000 to 2009 as illustrated in equation 3.

[2] Assuming a planting survival rate of 70 per cent (see table 1).

$$PV = A.\sum_{n=1}^{10} (1+i)^{n} \qquad (3)$$

where PV ≡ Present value of the annuity;

A ≡ Annuity;

i ≡ Interest rate;

n ≡ Period over which the annuity is paid.

It is assumed that the costs ('annuities') were spread in equal amounts over the 10 year period because these figures were presented as the total costs over the life of the project. Furthermore, the interest rate will be assumed to be 5 per cent (mean of 3 to 8 per cent – see sensitivity analysis in section 4). For example, if a particular cost over the life of the project was $100,000, then the annuity would be $10,000 and the corresponding future value of the annuity would be $132,068 at an interest rate of 5 per cent over 10 years.

3.2.1 Material Costs

Material costs consisted of plants, tree guards and stakes, ground ripping, fencing and incidental costs such as the rental cost of a water truck in the event that no local water is available (B. Dixon, personal communication, September 16, 2010). Over the 10 year period the total cost was approximately $210,000. Therefore, assuming the costs were incurred at $21,000 per annum from 2000 to 2009, the present value for the material costs (PV_{MC}) is calculated from equation 3 as $277,343.

3.2.2 Labour Costs

Volunteers

Volunteers contributed their time at a total of 20 planting events over the 10 year period. The number of volunteers varied for the different events. For example, for five plantings during 2005 to 2007 the number ranged between 79 and 183 (B. Dixon, personal communication, September 16, 2010). The total number of volunteer hours for planting over the 10 years is estimated to be 13,600 (2,280 volunteer days at 6 hours per day on average). Furthermore, volunteers also assist with the laying out of the plants the day before. A total of 1,200 volunteer hours are estimated over the 10 year period for this activity. This is based on 10 people working for 6 hours per day. Thus the total number of volunteer hours for these two activities is 14,800.

Choosing a wage rate for volunteer work is complicated by the fact that it is unpaid work. However, the work is of value and ought to be included in the project costs because the volunteers could have spent that time engaged in other activities. In other words, there is an opportunity cost of labour. The Commonwealth government calculates the in-kind contribution of volunteer labour at $30 per hour. At this wage rate the volunteer labour costs to date is $444,000. Volunteers also incur accommodation costs during the weekends when planting takes place. Furthermore, volunteers support the local community by attending a dinner on the Friday night. The typical annual cost for accommodation is $4,406 and for the dinners is $4,755 (B. Dixon, personal communication, December 9, 2010). The total of these costs is $91,610. From equation 3 the corresponding PV for volunteer labour costs is calculated as $707,369.

Steering Committee

The steering committee has met on 20 occasions over the past 10 years. This equals 420 hours at approximately 3 hours per meeting for the 7 steering committee members (B. Dixon, personal communication, September 16, 2010). Again, these labour costs are difficult to estimate. In this case, the minimum wage would be inappropriate given the skill level required to perform these duties. As a reference a range of advertised positions related to natural resource and environmental management taken from the NSW government employment website are displayed in appendix A. The hourly rates range between approximately $35 for junior professional levels and $75 for senior executive levels. Assuming the wage rate to be the mean value for this range ($55 per hour) means that the steering committee labour costs amounts to $23,100 over the entire period which is equivalent to a present value of $30,508.

Project Coordinator

The wages of a project coordinator employed by DECCW over the last 8 years of the project is estimated to be $25,000 per annum (B. Dixon, personal communication, September 16, 2010). As before the present value of this labour cost can be calculated from equation 3 at an interest rate of 05 per cent but with the period (n) being 8 years in this case. The present value of this labour cost is $250,664.

3.2.3 Opportunity Costs from Foregone Agricultural Production

Land in the Capertee Valley is mainly used for grazing to produce cattle. It should be borne in mind that the land currently used for revegetation has been set aside by the landowners mainly because it is of low production value or it is located on ‘lifestyle blocks’ where the primary purpose is not production (B. Dixon, personal communication, October 7, 2010). Even so this land could be set to productive use and as such its use for revegetation comes with an opportunity cost.

In estimating the possible income from agricultural production, gross margin budgets produced by the NSW Department of Primary Industries (2010) are used. These are typical of NSW graziers. However, within the boundaries of cattle grazing there is great variability depending on the type of animal and land used for grazing. A range of types of cattle operations is listed in appendix B together with the corresponding gross margins[3].

The mean gross margin for the different categories is used in the calculation and it is assumed that operations are distributed equally across the 90 ha of revegetated land. Furthermore, it is assumed that the plantings have taken place at a rate of 9 ha per annum and that the mean gross margins are representative of the past 10 years. The total NPV of production over the period 2000 – 2009 compounded at an interest rare of 5 per cent per annum is $65,659 (see table 3).

[3] Gross margins account for pasture costs where relevant and are based on June 2010 budgets. For more detail on the underlying assumptions visit the URL of the Department of Primary Industries (2010).

Table 3. Foregone income from agricultural production.

Year	Size of land (ha)	Production Value ($)	Net Present Value ($)
2000	0	0	0
2001	9	1,658	1,882
2002	18	3,316	3,584
2003	27	4,975	5,120
2004	36	6,633	6,501
2005	45	8,291	7,740
2006	54	9,950	8,845
2007	63	11,608	9,828
2008	72	13,266	10,697
2009	81	14,925	11,461
Total Net Present Value			*65,659*

3.2.4 Aggregate Cost Calculation

The aggregate cost is calculated from equation 2 using the above values for material, labour and opportunity costs from foregone farming as follows:

AC = $277,343 + ($707,369 + $30,508 + $250,664) + $65,659 = $1,331,542.

3.3 Benefit-Cost Ratio

The aggregate benefits and costs are compared by calculating the benefit-cost ratio (BCR) as illustrated in equation 4.

$$BCR = {}^{AB}\!/_{AC} \qquad (4)$$

A ratio of unity implies that the investment is marginal. A worthwhile investment would have to have a BCR greater than unity, whilst a BCR less than unity would under normal circumstances not be a worthwhile investment.

The benefits and costs are summarised in table 4. Comparing the aggregate benefits and costs for the Regent Honeyeater Project produces a BCR of 4.45.

Table 4. Summary of benefits and costs including the BCR.

<table>
<tr><th>Costs</th><th>Dollars ($)</th><th>Benefits</th><th>Dollars ($)</th></tr>
<tr><td>Materials</td><td>277,343</td><td rowspan="3">Native Vegetation</td><td rowspan="3">33,021</td></tr>
<tr><td>Labour - Volunteers</td><td>707,369</td></tr>
<tr><td>Labour - Steering Committee</td><td>30,508</td></tr>
<tr><td>Labour - Project Coordinator</td><td>250,664</td><td rowspan="2">Native Species</td><td rowspan="2">5,888,137</td></tr>
<tr><td>Foregone Agricultural Production</td><td>65,659</td></tr>
<tr><td>Aggregate Costs (AC)</td><td>1,737,506</td><td>Aggregate Benefits (AB)</td><td>5,921,158</td></tr>
<tr><td colspan="2">Benefit Cost Ratio</td><td colspan="2">4.45</td></tr>
</table>

3.4 Assumptions

The key assumptions as well as the distribution of associated values are listed in table 5. A number of the values cover significant ranges. The sensitivity of the CBA to these assumptions is discussed in section 4 – ‘Sensitivity Analysis’.

Table 5. Summary of key assumptions and corresponding distribution of values.

Variable	**Distribution**	**Units**
Interest rate	3 - 8	%
Steering Committee labour rate	35 - 75	$ per hr
Agricultural opportunity costs: Cattle gross margin	55 - 254	$ per ha
Survival rate of plantings	50 - 90	%
Probability of successful maturation of plantings (Pnv)	20 - 80	%
Probability of protection of native species (Pns)	20 - 80	%

4. Sensitivity Analysis

The BCA is dependent on a number of assumptions. In interpreting the result one must bear in mind the uncertainty associated when making the assumptions. To illustrate the sensitivity of the BCR to this uncertainty it was recalculated using the upper and lower bounds for the distributions in table 4. These values are summarised in table 6.

Table 6. Sensitivity of BCR to upper and lower bound values of assumption-based variables.

Variable	**Value**	**BCR**
Interest rate: Lower bound	3%	4.94
Interest rate: Upper bound	8%	3.79
Steering Committee labour rate: Lower bound	$35/hr	4.48
Steering Committee labour rate: Upper bound	$75/hr	4.41
Cattle gross margin: Lower bound	$55/ha	4.59
Cattle gross margin: Upper bound	$254/ha	4.28
Survival rate of plantings: Lower bound	50%	4.44
Survival rate of plantings: Upper bound	90%	4.45
Probability of successful maturation of plantings (Pnv): Lower bound	20%	1.78
Probability of successful maturation of plantings (Pnv): Upper bound	80%	7.11
Probability of protection of native species (Pns): Lower bound	20%	1.79
Probability of protection of native species (Pns): Upper bound	80%	7.10

P_{NV} and P_{NS} stand out as the variables with the most significant impact on the BCR. The sensitivity of the benefit estimates for the native species attribute (the second term in equation 1) is illustrated as a function of the two probability factors in appendix C.

5. Conclusion

The BCR, which in the sensitivity analysis falls between 1.78 and 7.11, suggests that the Regent Honeyeater Project is a worthwhile investment across a wide range of potential future scenarios. However, the BCA is dependent on a number of assumptions. In interpreting the result one must bear in mind the uncertainty associated with these assumptions. Nonetheless, the sensitivity analysis indicates that the BCR is positive for all outcomes.

As the Regent Honeyeater habitat restoration project develops, the uncertainty associated with future outcomes will naturally diminish. The uncertainty associated with the size and layout of the plantings in the Capertee Valley could have a major impact on how successful the project is. The outcome of the BCR is to a large degree dependent on the high benefit associated with the protection of the native species. Therefore a continued effort not only to maintain and develop the existing plantings towards maturity but to extend further the scale of the plantings if possible should be a worthwhile investment given the relative low cost associated with the planting activities compared to the large benefit derived from protection of native species.

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Appendix A. Natural resource and environmental management salaries in the NSW government

Title	Classification	Annual Salary	Hourly Rate (40hr week)
Director	Senior Officer Grade 2	$146,085 - $156,384	70.23 – 75.18
Manager	Clerk Grade 11/12	$103,026 - $119,149	49.53 – 57.28
Project Officer	Clerk Grade 7/8	$78,142 - $86,498	37.57 – 41.59
Implementation Officer	Clerk Grade 6/7	$73,709 - $80,479	35.44 – 38.69
Manager	Environment Officer Class 13	$112,865 - $120,895	54.26 – 58.12
Program Leader	Environment Officer Class 12	$105,047 - $115,289	50.50 – 55.42
Senior Project Officer	Environment Officer Class 9	$85,537 - $95,288	41.12 – 45.81
Planning Officer	Project Officer Grade 3 / 4	$82,077 - $92,513	39.46 – 44.48

Source: Jobs NSW (2010).

Appendix B. Gross margins for different cattle grazing operations

Category of beef cattle	$/ha
Inland weaners - stores	91.87
North Coastal weaners 2 (improved country)-stores	140.56
North Coast weaners 1 (unimproved country)- stores	54.69
Specialist local trade	123.41
Local trade/feeders (creep fed)	148.36
Young Cattle 15 - 20 months (moderate growth)	108.63
Young cattle (0-2 teeth), Heavy feeder steers	113.83
Yearling (Southern/Central NSW)	167.57
Growing out early weaned calves 160kg - 340kg	167.2
Growing out steers for feedlot market 240kg-420kg in 12 months	204.27
Growing out steers 240kg - 460kg in 12 months	254.02
EU cattle (0-4th)	158.36
Japanese Ox - grass-fed steers (0-6th)	106.72
Mean Gross Margin	141.50

Source: DPI (2010)

Appendix C. Impact of uncertainty in the protection of the native vegetation and native species on the native species benefit estimate in millions of dollars.

		P_{NV} (%)									
		10	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**
P_{NS} (%)	**10**	0.24	0.47	0.71	0.94	1.18	1.41	1.65	1.88	2.12	2.36
	20	0.47	0.94	1.41	1.88	2.36	2.83	3.30	3.77	4.24	4.71
	30	0.71	1.41	2.12	2.83	3.53	4.24	4.95	5.65	6.36	7.07
	40	0.94	1.88	2.83	3.77	4.71	5.65	6.59	7.54	8.48	9.42
	50	1.18	2.36	3.53	4.71	5.89	7.07	8.24	9.42	10.60	11.78
	60	1.41	2.83	4.24	5.65	7.07	8.48	9.89	11.31	12.72	14.13
	70	1.65	3.30	4.95	6.59	8.24	9.89	11.54	13.19	14.84	16.49
	80	1.88	3.77	5.65	7.54	9.42	11.31	13.19	15.07	16.96	18.84
	90	2.12	4.24	6.36	8.48	10.60	12.72	14.84	16.96	19.08	21.20
	100	2.36	4.71	7.07	9.42	11.78	14.13	16.49	18.84	21.20	23.55