

Valuation of Partial Interests in Land

This section focuses on the valuation of partial interests in land, particularly conservation easements. Given inactive markets for partial interests themselves, valuation of partial interests requires analysis of markets for underlying properties. The value of the partial interest must then be estimated indirectly as the difference between the value of the underlying property with and without the partial interest in question. As such, valuation of partial interests sheds light on property rights proposals currently being considered by Congress, which define compensation in terms of the value of a property with and without a particular Federal action.

Like gold or securities, land is an asset. As such, land is distinguished from immediate consumption goods by the fact that ownership provides benefits over an extended period of time. The value of an asset like land is based on expectations about the stream of benefits that ownership will provide over time. When we speak of value, we often think first of the value placed on an asset by the market—the “fair market value.” When we consider the decision of an individual to acquire or convey a partial interest in land, however, we must consider the after-tax value of the partial interest given the tax status of that particular individual. And when we consider the decision of a government agency or nonprofit organization to acquire or convey a partial interest, we must consider the value to society of the rights thereby established or relinquished. Government agencies or nonprofit organizations must pay the landowner enough to compensate for the rights the landowner is relinquishing, but they should not pay more than the results are worth to society.

None of these values are easily determined, since there does not yet exist an active market in conservation easements, since future costs and benefits are not known with certainty, since tax situations are complex and varied, and since social values generally depend on nonmarket factors. Nevertheless, approximations are possible, and it is on these approximations that easement values are typically based. In what follows, we will consider first the fair market values of partial interests in land; second, the after-tax values by which individuals decide whether to acquire, hold, donate, or sell partial interests in land; and third, the social values by which government agencies or nonprofit organizations decide whether to acquire, hold, or transfer partial interests in land. Finally, we take a second

look at the valuation of partial interests in the case studies already introduced: farmland protection easements, CRP contracts, and WRP easements.

Fair Market Value

In general, a property’s fair market value is the price at which the property would change hands between well-informed and willing buyers and sellers who are not under compulsion to buy or sell. If well-functioning markets exist for partial interests in land, the fair market value of such interests can be determined as the price at which comparable interests are traded. Such may be the case for subsurface mineral rights, for example, for which there are long-established commercial precedents. In the case of conservation easements or rental contracts, on the other hand, substantial records of transactions are not generally available, except in particular situations where programs (such as the CRP, the WRP, or State and county farmland protection programs) are already active. (Even in these cases, circumstances may differ significantly from one easement to the next, making it difficult to find truly comparable cases.) In the absence of active markets for easements, the fair market value of a conservation easement is generally estimated on the basis of “before-and-after” comparisons of the fair market value of the underlying land.

Before-and-After Comparisons

Before-and-after comparisons assume that markets for land are more active than markets for particular partial interests in land. Specifically, this process involves comparing the fair market value of the underlying land with and without the restrictions imposed by the conservation easement (Interagency Land Acquisition Conference, 1992). The fair market values of the land before and after an easement is granted are based on the “highest and best” uses of the land with and without the restrictions imposed by the easement.

Highest and Best Use

Economic theory suggests that, in a competitive market economy, potential users of a commodity will bid against each other for access to that commodity; those who plan to use it for the purpose that generates the highest expected returns will be able to outbid those who plan to use it for alternative, less profitable purposes. The appraisal literature cites four general criteria for determining highest and best use: of all uses

that are physically possible, legally permissible, and financially feasible, the highest and best use is that which affords the highest present value (Interagency Land Acquisition Conference, 1992). In the case of easement valuation, the notion of highest and best use is complicated by factors that will be considered further below.

Appraisal Methods¹⁰

Highest and best-use values before and after a property is encumbered by an easement are typically estimated using three related professional appraisal approaches, each of which has its own particular strengths and weaknesses. The first of these, the comparable sales approach, is generally considered most accurate in relation to active markets for uniform commodities (LTA & NTHP, 1990). This approach is potentially useful for appraisal of the value of a parcel of land before an easement is granted, but its usefulness in estimating the “after” value remains limited in many areas by the relative lack of comparable-sales data for properties encumbered by easements.¹¹ A second approach estimates the cost of replacing buildings and other improvements, less depreciation. This approach is of limited use in the valuation of conservation easements on unimproved land. The third approach, the income approach, is based on capitalization of the income that could be generated by land in its highest and best uses before and after encumbrance by the easement (LTA & NTHP, 1990). This approach requires information on expectations about future costs, returns, and capitalization rates; it becomes more difficult when net income or benefit streams are difficult to measure. In practice, the comparable-sales approach is generally used to estimate the land’s value before the easement is granted, and the income approach is generally used to estimate the value that the remaining (typically agricultural) use rights would have after the easement is granted.

Whichever appraisal techniques are used, the fair market value of the land before the easement is granted can be termed the unrestricted-use value of the land.

¹⁰This discussion provides an introduction to the concepts and issues involved in valuing conservation easements. Formal guidelines are presented in *Uniform Appraisal Standards for Federal Land Acquisition* (Interagency Land Acquisition Conference, 1992) and in the references cited therein.

¹¹Lancaster County, Pennsylvania, is one area that now collects and publishes such data routinely (LCAPB, 1996).

The fair market value of the land after the easement is granted can be termed the restricted-use value of the land. The fair market value of the *easement* is estimated as the difference between the unrestricted-use value of the land and the restricted-use value of the land.

Highest and Best Use Refined

Despite guidelines provided in statutes and regulations, a considerable degree of ambiguity surrounds the valuation of conservation easements. This ambiguity derives in turn from a lack of precision in determining highest and best use, both before and after restrictions are placed on the land. We noted earlier that highest and best use refers in general to that physically possible, legally permissible, and financially feasible use that affords the highest present value. In *Appraising Easements*, a respected reference in the field of land conservation, highest and best use is defined as “that reasonable and probable use that will support the highest present value for the property as of the date of the appraisal” (LTA & NTHP, 1990: 19). Both of these definitions are limited by an apparent implicit assumption that a *single* use will remain highest and best for a particular parcel of land in perpetuity. In fact, returns to alternative land uses may change over time, meaning that the use determined to be currently highest and best may itself change from one period to the next. This suggests that easement appraisals should be based on before-and-after comparison of the present value of land not under a single highest and best use, but rather under the feasible *sequence* of highest and best uses over time.¹²

Thus, we need to consider streams of expected net returns to alternative uses over time, and then determine the sequence of present and future uses that provides the highest present value as of the date of the appraisal. (Such a sequence would have to be feasible in the sense of recognizing, for example, the difficulty of reverting from urban to agricultural use as conditions change. This could be accomplished by incorporating costs of converting from one use to another.) IRS regulations do include instructions to consider “not only the current use of the property but also an objective assessment of how immediate or remote the

¹²The range of legally permissible uses may also change over time. Although efforts to anticipate zoning changes quickly become very complicated and uncertain, appraisers are required to estimate the likelihood of zoning changes (Daniels, 1994).

likelihood is that the property, absent the restriction, would in fact be developed” (26 CFR 170A-14(h)). But this consideration apparently takes the form of adjustments to a simple discount rate, rather than explicit consideration of a stream of variable returns to alternative land uses over time. The latter requires a more general form of present value estimation known as “discounted cash flow analysis” (LTA & NTHP, 1990: 28).

Consider the example of a parcel of farmland near an expanding urban area. To acquire a conservation easement on the land, an agent interested in preventing development must compete for the development rights against others who may be interested in developing the land (now or in the future). The value of the conservation easement is thus determined by the value of returns to alternative uses of the land, as reflected in the prices evident in the market for comparable properties in a given area.

Sequences of returns to competing uses will determine the property’s value; if a developer’s estimate of the profits he or she can make from subdividing the property (returns to development) exceed the farmland owner’s estimate of the land’s value in agricultural commodity production, the developer may be able to bid the land away from the farmland owner by offering him or her more than the land’s agricultural value. (In most cases, speculators and developers, with their particular skills, connections, and objectives, mediate the market between the original farmland owners and the eventual residential or commercial occupants of developed land.) Most land is held for relatively long periods so the decision for the developer and the farmland owner in this example involves estimating streams of returns over time. In making these calculations, the developer and the farmland owner must estimate returns to development and farming for as long as they plan to hold the property. Future returns to agricultural and urban uses are never known with certainty. Costs, yields, and output prices are all subject to fluctuations due to factors beyond the landowner’s control, meaning returns to land are uncertain even when uses and technologies are well established.

Uncertainty

There are many ways to deal with uncertainty. Prospective landowners could assume, naively, that

returns to alternative uses will not change over time. Alternatively, prospective landowners could assume that returns to alternative uses will change over time according to a particular pattern. Let us consider a simple example. Assume that there are equal probabilities that the returns from farming will increase or decrease from one year to the next, and that the possible changes are the same size. In period zero, net returns from agriculture are known to be \$100. In period one, net returns from agriculture can take on two values, \$110 or \$90 per acre, each with probability 0.5. Expected returns will be $0.5 \times \$110 + 0.5 \times \$90 = \$100$ per acre. In each subsequent period, returns will rise or fall by \$10 with equal probability. Eventually, in period five, net returns from agriculture will take on one of six values: \$150, \$130, \$110, \$90, \$70, or \$50 per acre, with probabilities 1/32, 5/32, 10/32, 10/32, 5/32, and 1/32, respectively. The expected level (today) of returns in period five is \$100 per acre. In fact, because of the assumptions that characterize this simple random walk, the expected level (today) of future agricultural returns remains at \$100 per acre for all periods in this example. Over a 5-year period, the expected returns to agricultural use (R_a) and their variability (measured by the standard deviation, σ_a) can be depicted as:

	t = 0	t = 1	t = 2	t = 3	t = 4	t = 5
R_a	100	100	100	100	100	100
σ_a	0.0	10.0	14.1	17.3	20.0	22.4

If the possible changes (upward and downward) are not of the same size, or the probabilities of the various changes are different, the expected level (today) of future returns will be different for each period. For example, if the probability that returns increase by 20 in any period is 1/2 and the probability that they decrease by 10 is also 1/2, expected returns (today) and their standard deviation for each period will be as follows:

	t = 0	t = 1	t = 2	t = 3	t = 4	t = 5
R_a	100	105	110	115	120	125
σ_a	0.0	15.0	21.2	26.0	30.0	33.5

Incorporating uncertainty into the process of valuing expected returns allows the landowner to explicitly account for the possibility that returns to land may change over time.¹³

An Example

Let us return to our example of a parcel of farmland near an expanding urban area. The land in our example is physically suitable for agricultural or urban use, and both uses are legally permissible and financially feasible. We need to determine what use, or sequence of uses, is financially optimal. For simplicity, assume that conversion is costless and that expected net returns are as illustrated in figure 5. In this example, expected net returns to agricultural use are constant at \$100 per acre per year (R_a). Net returns to urban use are expected to remain constant at \$50 per acre per year indefinitely (R_u). Capitalizing these streams of expected net returns at an annual rate of 5 percent yields a present value of $\$100/0.05 = \$2,000$ per acre in agricultural use and a value of $\$50/0.05 = \$1,000$ per acre in urban use. In this example, agriculture is the land's highest and best use, it is never optimal to convert to urban use, and the fair market value of the land today is \$2,000 per acre.¹⁴ The value of a farmland preservation easement on this property would be \$0 per acre, the difference between the land's fair market value (\$2,000 per acre) and its restricted-use value (also \$2,000 per acre).

Next, let us complicate the example by considering the impact of an announcement of plans to develop nearby land for residential and commercial use. Such development plans must be approved by State, local, and sometimes Federal authorities. Let us assume that the probability of approval for a particular development project is 50 percent, and that expected net returns to agricultural use are unaffected (figure 6). If the plans are approved, development of the nearby land will take place, and net returns to urban use of our parcel will rise to \$250 per acre per year beginning next year (R_u^{high}). If the plans are not approved, development will not take place on the nearby parcel, and net returns to urban use of our parcel will remain

Figure 5

Valuing certain returns to land

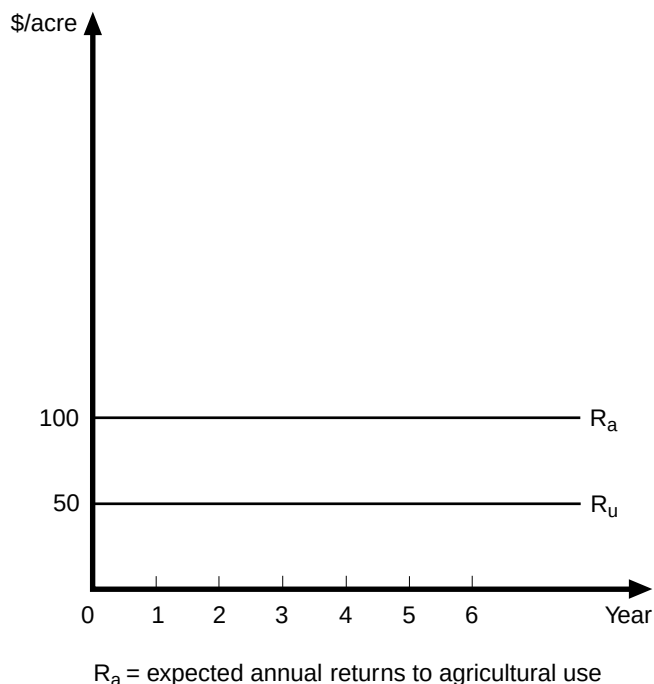
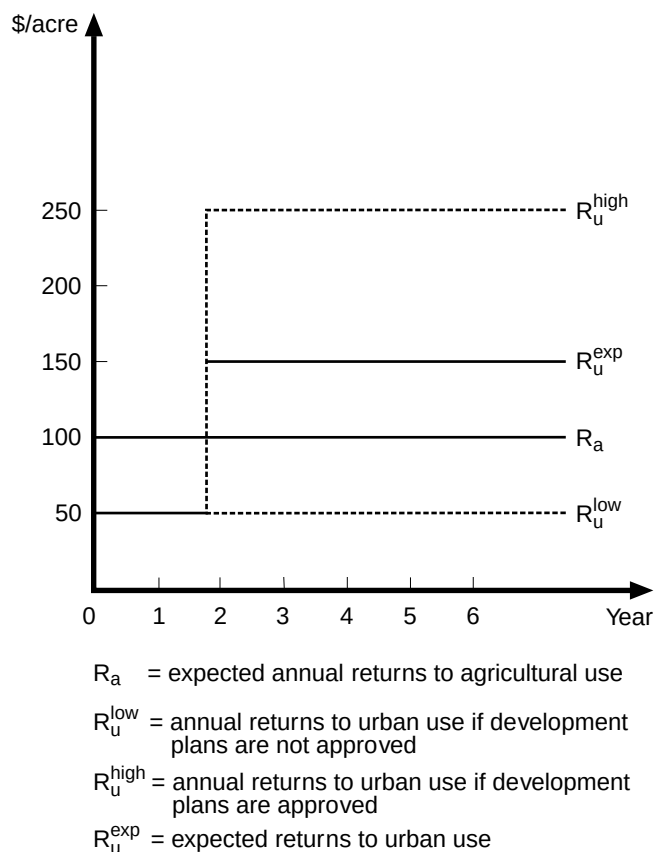


Figure 6

Valuing uncertain returns to land



¹³Although we will not do so in this paper, it is also possible to generalize to the case where returns to both agricultural and urban use follow stochastic processes (see Capozza and Li, 1994).

¹⁴We consider only a single intensity of urban use here. Other sources, such as Mischynski (1978), generalize to multiple intensities.

at \$50 per acre per year (R_u^{low}). The expected level of net returns to urban use of our parcel is $0.5 \times \$250 + 0.5 \times \$50 = \$150$ per acre per year from next year on (R_u^{exp}).

Now what is the highest and best use of this parcel? The answer depends on how returns are capitalized into present values. Simple capitalization, based on current net returns and interest rates, yields one answer. Capitalization of changing net returns to alternative single uses yields another. Capitalization of changing net returns to the optimal *sequence* of uses yields a third. A fourth alternative incorporates the value of the option of waiting for future information to become available. These distinctions are important because they give us differing estimates of the fair market value of the parcel, and thus of the value of a conservation easement on the land. They also indicate different optimal times of conversion. The four techniques are compared below; results are summarized in box 5. The equations by which these present values are estimated are presented in the appendix.

Method 1. Simple capitalization assumes current returns and interest rates persist indefinitely into the future. In our example, this approach would disregard the possible impact of adjacent development on the parcel under consideration. If current returns are capitalized at a 5-percent annual rate, such a procedure would yield a present value of $\$100/0.05 = \$2,000$ per acre for the land in agricultural use, and a present value of $\$50/0.05 = \$1,000$ per acre in urban use. This suggests that agricultural use is the highest and best, as above. Then, the fair market value of the land would be \$2,000 per acre, and it would never be optimal to convert the land to urban use. Using this method, the present value of a conservation easement permanently restricting urban use would be the fair market value minus the agricultural use value, or $\$2,000 - \$2,000 = \$0$ per acre, even though the parcel faces the possibility of imminent development pressure. This example demonstrates that it is costly to disregard information about the future, and simple capitalization is clearly inadequate when expected net returns are changing over time.

Method 2. Alternatively, if changing expected returns to alternative single uses are capitalized at a 5-percent annual rate, the present value of the land in agricultural use is \$2,000 per acre, and the present value of the land in urban use is \$2,905 per acre —

reflecting expectations of increased returns to urban use in the future. This method suggests that urban use is the highest and best, and that conversion to urban use should take place immediately. In this case, the fair market value of the land would be \$2,905 per acre, it would be optimal to convert to urban use immediately, and the present value of a conservation easement permanently restricting urban use would be $\$2,905 - \$2,000 = \$905$ per acre.

Method 3. We can improve on this estimate, however, if we consider the highest and best *sequence* of uses—that is, the sequence of uses that are expected to prove optimal in each period. Figure 6 illustrates that expected annual net returns to agricultural use exceed expected annual net returns to urban use in the first year, and that urban use generates higher expected annual net returns thereafter. Given costless conversion, the best strategy for the landowner would be to keep the land in agricultural use for the first year and then convert to urban use. The present value of the land in this optimal sequence of uses is \$2,952 per acre. In this case the fair market value of the land would be \$2,952 per acre, the optimal time to convert to urban use would be in the second year, and the present value of a conservation easement permanently restricting urban use would be $\$2,952 - \$2,000 = \$952$ per acre.

Method 4. The uncertainty surrounding the approval of the plans for development of nearby land creates an additional factor that we have not yet considered. This is the option of waiting a year—not before developing but before *deciding* whether or not to develop the parcel of land in our example—and then developing only if the adjacent development is approved and urban returns to our parcel jump to \$250 per acre per year. (If the adjacent development plan is denied, urban returns to our parcel would remain at \$50 per acre per year, and it would be optimal for the parcel to remain in agriculture, generating expected net returns of \$100 per acre per year and a present value of \$2,000 per acre.) Given first-year returns of \$100 per acre from agriculture and equal probabilities of subsequent development or continued agricultural use, the present value of this option is \$3,429 per acre. Thus, the fair market value of the land is \$3,429 per acre, and the optimal time to convert to urban use is either in the second year (if the adjacent development is approved) or not at all (if the adjacent development plan is denied). The present value today of a conser-

vation easement permanently restricting urban use is
 $\$3,429 - \$2,000 = \$1,429$ per acre.

Box 5 summarizes the assumptions on which the example is based and the resulting differences between valuation methods 1-4. Each successive method values a conservation easement on the parcel of land in our example more highly, since each incorporates a progressively more accurate recognition of the optimal sequence of returns that are expected to flow to the parcel of land. Method 1 is clearly inadequate, since it disregards the possible impact of adjacent development entirely. Method 2 recognizes this possible impact, but is limited to a comparison of alternative single uses of the parcel. Method 3 recognizes that it may not be optimal to convert the parcel for development immediately, while method 4 recog-

nizes the additional value of waiting before making a decision on conversion. Each additional factor incorporated adds to the present value today of the land before conservation restrictions are imposed (V_{B0}), and thus adds to the present value today of the conservation easement itself (V_{e0}).

Each successive method also changes the optimal time of conversion for urban use. Method 1 suggests conversion is never optimal, since it disregards information about changing returns to urban use in the future. Method 2 suggests that conversion should take place in the first year, since it requires an immediate choice between the two alternative single uses. Method 3 recognizes that the optimal stream of returns includes agricultural use in the first year, and that conversion should take place in the second year. Finally, method

Box 5—Alternative Ways to Estimate the Value of a Conservation Easement

The table below summarizes alternative ways to estimate the per-acre value of a conservation easement, as discussed in the text, based on the expected net returns illustrated in figure 6. Complete derivations are presented in the appendix.

Method 1 compares the two uses assuming that expected returns remain constant at current levels.
 Method 2 compares the two uses recognizing that expected urban returns change after the first year.
 Method 3 considers the best sequence of uses, if conversion were to take place at the optimal time.
 Method 4 considers the option of waiting for more information on adjacent development plans.

Definitions and assumptions

R_{at}	expected annual net returns to agricultural use (\$100 per acre every year)
R_{ut}	expected annual net returns to urban use (\$50 per acre in the first year, then \$150 per acre every year thereafter)
i	discount rate (5 percent per year, every year)
T	duration of the easement (infinite)
V_{B0}	today's per-acre value of the land before restrictions are imposed (determined below)
V_{A0}	today's per-acre value of the land after restrictions are imposed (\$2,000 per acre)
V_{e0}	today's per-acre easement value; $= V_{B0} - V_{A0}$ (determined below)
t^*	optimal time to convert from agricultural to developed use (determined below)

Results

Method	V_{B0}	V_{A0}	V_{e0}	t^*
1	\$2,000	\$2,000	\$0	never
2	\$2,905	\$2,000	\$905	1st year
3	\$2,952	\$2,000	\$952	2nd year
4	\$3,429	\$2,000	\$1,429	2nd year or not at all

4 incorporates the option of waiting to hear whether the adjacent development project has been approved; if so, conversion should take place in the second year; if not, the land should remain in agricultural use.

More generally, the value of the option of waiting for new information before deciding to convert is illustrated in figure 7. If returns to agricultural use are constant while returns to urban use are increasing, the option value of waiting until t^{**} to decide whether or not to convert (instead of converting at t^*) is displayed on the vertical axis. The implication of this result is that farmland may be converted for development too soon if this option value is not recognized.

Irreversible Investment Under Uncertainty

This line of reasoning has been extended in the theoretical literature, and is described briefly below. When land conversion is irreversible, conversion decisions are made under uncertainty, and decisions can be delayed to take advantage of new information, conversion decisions can be modeled as irreversible investments under uncertainty (Pindyck, 1991). The decision by a landowner to surrender development rights is analogous to an investment decision that meets these three criteria.

The decision is irreversible in two senses. First, land development typically involves considerable invest-

ment in infrastructure, and restoration of farmland would require even greater expenditure to clear away such infrastructure. Such expenditure is rarely justified by expected benefits from farmland restoration. And second, donated conservation easements must be granted in perpetuity in order to qualify for Federal income and estate tax benefits.¹⁵

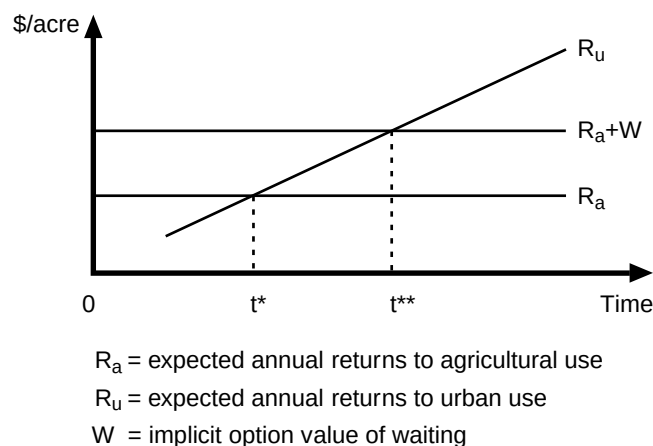
The decision to surrender development rights involves uncertainty because the economic and environmental conditions underlying future agricultural and urban returns are unknown today. Information about these conditions becomes available only gradually.

Finally, the decision to surrender development rights can be delayed, if the landowner wishes, in order to take advantage of new information about changing economic and environmental conditions. The landowner may decide to sell development rights at any time. (In practice, however, the landowner may not find a willing buyer with available funds at any time. The Lancaster County Agricultural Preserve Board, for example, currently has a waiting list of 5-10 years—Daniels, 1994.)

When these three criteria are met, it may be to the landowner's advantage to delay the decision to surrender development rights. The decision is said to entail an implicit option for the value of waiting. This approach has been developed in the economics literature by Dixit and Pindyck (1994) and others, and in the financial literature by Sick (1989). In the latter, the approach is called real option theory and has been applied to farmland conversion decisions by Capozza and Sick (1994).

In this section, we have considered the role of uncertainty in the estimation of returns to alternative uses of land, and have shown that the value of conservation easements may increase as more information becomes available and as restrictive assumptions are relaxed. While the specific values compared depend on the parameters of our particular example, the general lesson to be learned is that valuation of partial

Figure 7
Optimal time of conversion



¹⁵The use of conservation easements is relatively new, and the definition of perpetuity has not yet been seriously challenged. Easement programs sometimes offer buy-back opportunities if, after a number of years, the purposes for which the easement was established can no longer reasonably be accomplished. Government agencies can also condemn land subject to an easement in order to further other public purposes, such as road construction (Daniels, 1994), as discussed earlier.

interests in land, particularly in the absence of active markets for those partial interests, is a complex and difficult task.

After-Tax Value

The fair market value of a partial interest in land is the value at which an interest could be bought or sold on the market. Whether or not a particular landowner decides to hold onto a property's development rights, or to convey them via donation or sale to a nonprofit organization or government agency, depends on how much of this fair market value is actually realized by the landowner and his or her heirs after a variety of taxes have been considered. Income, estate, and property taxes vary with the particular circumstances of individual landowners, and are discussed in turn below.

Income Taxes

The Federal Government has long used the tax code to provide incentives for individual behavior consistent with public objectives, including environmental protection. It is only relatively recently that conservation easements have been explicitly treated in the tax code. In calculating income for Federal income tax purposes, deduction of the value of certain donated partial interests in land was first permitted by an IRS ruling in 1964 and the Tax Reform Act of 1969 (Powell, 1989). The Tax Reform Act of 1976 and subsequent amendments provided, for the first time, express statutory authority enabling taxpayers to claim deductions for charitable contributions of conservation easements to government agencies or qualifying nonprofit organizations (Small, 1990).

The Federal tax consequences of conservation easement donation are spelled out in statute (26 USC 170) and IRS regulations (26 CFR 1.170A). If the easement meets certain criteria established by the IRS, the donor may claim the value of the donation (or of the difference between the easement's fair market value and its bargain sale price) as a deduction on his or her Federal income tax return. To meet the criteria, the easement must incorporate perpetual restrictions for qualified conservation purposes, and it must be donated to an organization with the commitment and resources to enforce the restrictions over time. Qualified conservation purposes include the preservation of land with significant public benefits in terms of outdoor recreation and education, habitat, open space, or historical importance (26 CFR 1.170A-14).

The full value of conservation easement donations that meet these criteria can be deducted from an individual's income in the year in which the donation was made, as long as the deduction does not exceed 30 percent of the individual's adjusted gross income. If the value of the donation exceeds 30 percent of the donor's income, the deduction can be carried over, subject to the same limit, for up to 5 additional years.

With regard to income taxes, capital gains may be a particularly important consideration. When land is sold, the increase in value (over the base value the property had when first acquired by the landowner) is treated as a capital gain. On undeveloped land that has been held for a long time in proximity to a growing urban area, the increase may be due largely to development pressure, and it may be substantial.

Estate Taxes

Under current tax law, the full fair market value of estates exceeding \$600,000 is taxable at rates of up to 55 percent, generally payable by the heirs within 9 months after the decedent's death. Like the income tax code, however, the estate tax code has been modified to influence the behavior of individuals, including landowners, to accomplish public purposes. The fair market value of a perpetual conservation easement that is donated to a qualified nonprofit organization or government agency, or the difference between the fair market value and the (bargain) price at which a perpetual conservation easement is sold, can be excluded from the value of a decedent's estate for Federal estate tax purposes. This is true whether the easement was donated during the landowner's lifetime or donated by will at death. Legislative proposals introduced in recent sessions of Congress would further exclude the value of the residual rights retained in the estate on certain easement-encumbered land, such as land within 50 miles of metropolitan areas that is facing significant development pressure.

Without an easement, land is valued at its full, unrestricted fair market value for estate tax purposes unless it qualifies for use-value assessment under the conditions of the Federal tax code (which are not the same as the State and local use-value assessment criteria for property tax purposes discussed below and in the section on farmland protection in "Partial Interests in Three Policy Settings"). To qualify for use-value assessment for estate tax purposes, Federal tax law requires that the decedent must have materially partic-

ipated in farming the land for at least 5 of the 8 years prior to his or her death, and that the heirs must continue farming the land for at least 10 subsequent years (26 CFR 2032A).

Property Taxes

To the extent that an easement represents permanent restrictions on how a parcel of land can be used, it reduces the fair market value of that parcel of land. Nevertheless, assessment of value for property tax purposes is the responsibility of local assessors, and they may vary in their consideration of such value changes. As a result, conveyance of a conservation easement may not result in reduced property taxes in all cases. In fact, this has been a major concern of farmland owners participating in the WRP (Soil and Water Conservation Society, 1994).¹⁶

Farmland owners are concerned because when an easement is sold at its fair market value, as in the case of the WRP, the landowner's wealth has not declined, but the share of that wealth represented by real property has declined. Landowners argue that the real property portion represented by the value of the easement has been extinguished and is no longer subject to property taxation, just as the right to use the land more intensively was extinguished by the easement itself. Not all assessors agree (Stockford, 1990). An argument might be made that the government agency or nonprofit organization that acquired the easement should be liable for property tax payments. The Federal Government makes payments in lieu of taxes to compensate local jurisdictions for loss of property tax revenue, but only where the Federal Government owns land in fee (U.S. Dept. of the Interior, BLM, 1995; Buland, 1995). These payments total about \$100 million per year (U.S. Dept. of the Interior, BLM, 1994).

In the case of farmland protection, since all 50 States currently have use-value assessment programs in place, much farmland may already be assessed at less than its full, unrestricted value. Participating farms would already be paying property taxes based on the restricted-use value of the land, and conveyance of a farmland protection easement would likely have no further effect on their property tax assessment.

¹⁶The South Dakota Supreme Court has upheld several landowner challenges to local assessors over property tax assessments. As a result, cropland entering WRP in South Dakota will be valued, for property tax purposes, at most of its hayland or grassland value (Buland, 1995).

Implications for Landowner Decisionmaking

The cumulative effects of income, estate, and property taxes are an important consideration in any prospective transfer of a partial interest in land. Stephen Small, an attorney who specializes in estate planning, points out that most landowners do not want to deal with the complexities of conservation easements or estate planning until compelled to do so by the realization that their heirs may be forced to sell all or part of a family's property in order to pay estate taxes (Small, 1992). In combination with income tax benefits, estate planning provides a powerful incentive for some landowners to donate a conservation easement (or sell it at a bargain price) to a qualified organization.

Social Value

Social value is a third dimension of value that must be considered in relation to partial interests in land. While fair market value represents that price at which an interest is expected to change hands between willing buyers and sellers in a well-functioning market, and after-tax values reflect the differing net returns realized by sellers in different financial circumstances, social value reflects the benefits to society from acquisition of a particular interest in land. Just as a landowner considers after-tax values in deciding whether or how to convey an easement, a government agency or nonprofit organization must consider the easement's social value relative to its market value in deciding whether or how to acquire that easement. (In general, it is the market value of the interest acquired, not the interest's value to the acquiring agency, that is to be considered in appraising the interest, but clearly the interest's value to the agency must match or exceed the interest's market value before the agency can justify acquiring it.)

For example, once a farmland protection easement is priced (based on the difference between privately available returns to compatible uses and foregone returns to development), the interested public agency or nonprofit organization needs to determine whether the easement is worth acquiring. Similarly, once a wetland easement is priced (based on the difference between privately available returns to wetlands-compatible uses and foregone returns to farming), the interested public agency or nonprofit organization needs to determine whether the easement is worth acquiring.

Estimates of the social value of habitat, ecological, or other services are relevant in making this determination. In general, however, these services are considered social precisely because they are nonmarket in nature. As a result, estimates of such values are difficult to derive, and range widely with the particular function, specific type of land or wetland, and geographic location of a property. Various valuation methods (such as contingent valuation) have been developed for this purpose, but will not be described further here. (See, for example, Mitchell and Carson, 1989).

Case Studies Revisited

In this section, we take a brief second look, in light of our discussion of fair-market, after-tax, and social values, at the partial interests described in the case studies of “Partial Interests in Three Policy Settings.”

Farmland Protection Easements

Farmland protection easements were the subject of our earlier fair market valuation example. At this point, we simply note that the decisions of individual landowners to participate in nonprofit or public farmland protection programs will depend on how fair market value compares with after-tax values in each particular case. The decisions of individual organizations to acquire particular easements will depend on how fair market value compares with social values in each particular case.

Conservation Reserve Program Contracts

The valuation procedure implemented in the CRP differs from the one we described earlier in that it does not fully consider the residual value of land rights held by the landowner after the CRP contract has been signed. As defined earlier, the fair market value of the partial interest acquired is based on the difference between returns to soil conservation-compatible uses and foregone returns to farming, where the latter is the fair market rental value of the land unencumbered by the CRP contract. (This assumes that there is no development pressure, which may not always be the case.) Estimates of the rental value of retired cropland in soil conservation-compatible uses can only be based on returns that are likely to be available to private landowners. Estimates of such rental values presented above range from \$5 per acre to \$28 per acre

for hunting (Williams, 1991). Depending on how CRP contracts are revised for future signups, other possible sources of market returns to participating landowners might include haying, grazing, or subsurface mineral rights. In practice, however, residual returns to activities such as hunting or birdwatching are difficult to measure and typically small in relation to agricultural returns, so the capitalized value of comparable cropland rental rates may be a reasonable approximation.

Wetlands Reserve Program Easements

As in the case of the CRP, the value of the WRP easement should be based on the difference between returns to wetlands-compatible uses and foregone returns to farming—in this case, the fair market value of the land unencumbered by an easement. (Again, we assume that there is no development pressure, although this clearly would not be the case for WRP acreage on Long Island or in parts of California.) The distinction in the case of the WRP is that this difference is calculated in perpetuity instead of over 10 years, as in the case of the CRP. The perpetual term of WRP easements to date suggests that the pricing procedure may be similar to the farmland protection case we developed earlier. The wetlands case is complicated because residual wetlands-compatible uses are more likely to be nonmarket or social in nature than are the residual agricultural uses considered in the farmland protection example, and thus more difficult to value. To illustrate this difficulty, table 6 presents a wide range of estimates of social and market values for various wetland functions and types.

While the social values of wetlands may be significant, the discussion earlier demonstrates that the fair market value of wetlands after they are encumbered by an easement is based on the value of market services, since these represent the returns that are likely to be available to private wetland owners. Estimates of the market values presented in table 6 range widely, from less than \$10 per acre to more than \$10,000 per acre. Other possible sources of market returns on land encumbered by a WRP easement might be haying, grazing, recreation, or subsurface mineral rights, provided they are compatible with the terms of the WRP easement. The wide range of values illustrates the difficulties inherent in valuing wetlands and wetland functions, even for a single wetland type and location, let alone on a programmatic basis.

Table 6—Illustrative wetland functions and estimated values

Function	State and wetland type	Value
		<i>\$/acre</i>
Social values:		
Fish and wildlife habitat—		
Mammal/reptile	Louisiana coastal	12
Fish/shellfish	Louisiana coastal	32 - 66
Waterfowl	Massachusetts coastal marsh	167
General	Michigan coastal marshes	843
Ecological services—		
Sediment accretion	Georgia river	3
Flood control	Massachusetts river	362
Water quality	Georgia river	1,108
Waste assimilation	Virginia tidal marsh	6,225
Life support	Georgia river	10,333
Other services—		
Education/research	Louisiana coastal	6
Recreation	Massachusetts river	38
Recreation	Louisiana coastal	45
Recreation	Florida estuary	76
Historic and archeological	Louisiana coastal	323
Market values:		
Market services—		
Waterfowl hunting	Mississippi bottomlands	12 - 17
Fish production	Virginia tidal marsh	269
Timber production	Georgia river	1,605
Aquaculture	Virginia tidal marsh	872 - 2,241

Sources: Bardecki (1984); Council on Environmental Quality (1978); Heimlich and Langner (1986); Heimlich (1994a).