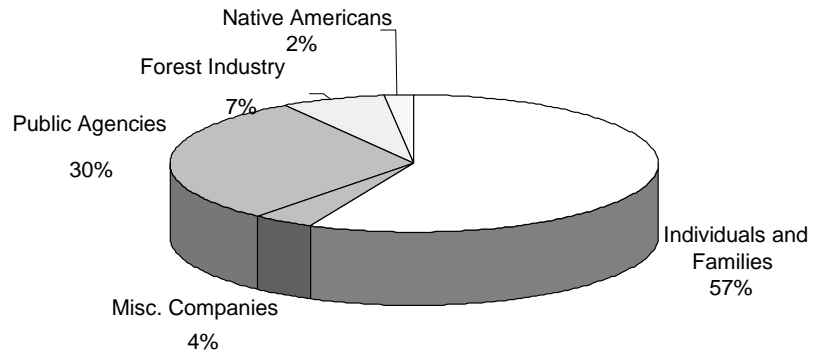


Incentives to Join Forestry Cooperatives

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Motivation

Wisconsin Forest Ownership



Motivation

- Non-industrial private forest (NIPF) landowners in WI:
 - 260,000 landowners
 - Sales ⇒ 10,000 new owners/year
 - 9.7 million acres of forest (1/4 the area of the state)
 - 65% of the raw material used by WI forest product industries
 - Only about ¼ have an active forest management plan

Motivation

- *Parcelization* is increasing
 - NIPF parcels too small to obtain some economic and ecological objectives
- State and federal government interest in sustainable forestry management
 - Wisconsin: MFL
- Cross-boundary cooperation leads to greater ecological benefits

Motivation

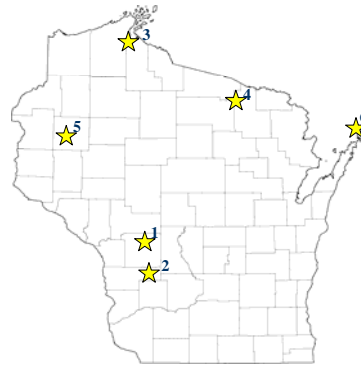
- The cooperative model seems an ideal solution
- Forestry cooperatives successful in Europe, Canada and elsewhere
- Yet—today, few forestry cooperatives exist in the US

Forestry Co-op Revival

- First forestry co-ops in the US in 1900s
 - 1930s: almost 70 in operation
- Primary reason for demise: insufficient member support.
 - Lumpy returns (patronage refunds 2Xlifetime)
 - Diverse membership objectives

Forestry Co-op Revival

- Today, 9 established forestry co-ops in US
 - 15 or so being developed across the US
 - 6 established in WI
 - WI efforts initially lead by interest in value-added (top-down)
 - State agencies, co-op development specialists, and forestry resource professionals



Challenges

- A few recent high profile forestry co-op failures
 - Lack of member support (investment & supply)
 - Diverse membership objectives
- NIPF landowner objectives:
 - Amenity perspective
 - Asset perspective
- Spatial (density) issue; requires diverse membership

Research question

- In a landscape comprised of landowners with both amenity and asset perspectives, is a “value-added” forestry co-op viable?
 - Will the co-op be able to attract a sufficient pool of capital and timber?

Model

- Two types of landowners: amenity (i) and asset (j) perspectives.
 - Amenity agent focused on managing forest for non-timber products (exclusively)
 - Asset agent focused on managing forest for timber (exclusively)
 - Equivalent to *specialized management* (Boscolo and Vincent): produces multiple values at landscape level

Model

- Utility maximization, one-period model
- Landowners are endowed w/ fixed acreage (L)
 - Assumed to be uniform quality, uniform volume
- Amenity (A) is generic
 - Function of two inputs: management education (positive) and timber harvesting (negative)
 - No additional costs

Model

- Annualized harvest (h) is a function of stand size:
 - $y * L = h$, where y = timber/acre
- Amenity agent harvests at biological maturity
- Asset agent harvests at economic maturity
 - Therefore, $h_j > h_i$

Model

- The cooperative provides members with:
 - Management education (E)
 - Management services (inputs) (S) at lower cost
 - Logging coordination (LC) at lower cost
 - Marketing timber for a higher price
- One-time membership fee (M) based on acreage
- Annual patronage refund (PR) based on timber marketing (h)
- Higher profits from marketing than provision of management education and services

Amenity agent

$$\max_a U_i = a(e, h) + pr(h) - m(L) - c(h)$$

$$a = a(e-h)$$

$$pr = (h/H)\Pi$$

$$m = fL, \text{ where } f = \text{fee/acre}$$

$$e = m$$

Solution will involve a tradeoff between e and h , or m and h .

Willing to take financial hit for higher utility

Asset agent

$$\max_h U_j = \Pi = pr(h^c) + (p^* h^m) - m(L) - c(h)$$

$$h^c + h^m = h$$

$$pr = (h^c/H)\Pi$$

$$m = fL, \text{ where } f = \text{fee/acre}$$

Solution will involve a tradeoff between p and pr ;
where $mc = mb$.

The solution

- Co-op is viable if:

$$n^* m + r(h) = c(h,e) - PR$$

n = total # of landowner members

$c(h,e)$ = total cost function

Next steps: empirical estimation

- Collect data:
 - “willingness-to-invest”
 - Management objectives
 - Landowner and harvest characteristics
 - Amenity and harvest trade-off (compare harvest across obj)
- Simulations: modify membership fee and patronage refund mechanism (financial structure of co-op)
- Voting rights

Contact information

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