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A forest conservation program of the

The Nature Conservancy®

Center for Compatible Economic Development

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EXECUTIVE SUMMARY

The Center for Compatible Economic Development was engaged by the Great Lakes National Program Office to test the feasibility of the Forest Bank concept at two sites within the Great Lakes basin. Previous and match funding allowed us to narrow our field to the two target sites.

The Forest Bank idea is an innovative concept that could provide a market-based tool for conservation of important forest land while helping to keep it economically productive.

Given the complexity of the idea and the many variables that will impact on the potential success of a Forest Bank, our goal was to create a rigorous methodology for analyzing sites and providing a clear and honest assessment of their potential. We believe that we have succeeded in this aim.

Potential sites were identified initially based on scientific and conservation criteria. Subsequent analyses looked at the functional and operational aspects of the forest resource, landowner patterns, timber markets and other issues that would affect potential sites. Our clear intention was to find a site or sites that would be suitable places to implement a pilot Forest Bank with a high likelihood of success. As we identified obstacles to success at any given site, we dropped it from the process and concentrated our effort and resources on the remaining sites. Thus, our analysis for each of the sites is of varying intensity as warranted by its potential for implementation.

The direct outcomes of the work completed for the EPAare:

1. **We created and field-tested a comprehensive, comparative methodology for assessing potential Forest Bank sites**;
2. **We pursued analyses of these sites as long as they had potential for implementation. This included:**
   - Identifying an initial suite of 27 potential sites based on ecological and landscape criteria;
   - Using preliminary criteria to pare this to nine sites, and consolidating some of those sites to create a complex of sites, or a megasite;
   - Analyzing critical aspects of the remaining nine sites and eliminating sites that fell out of the process for various reasons identified in the report and the appendices;
   - Completing a detailed forest feasibility analyses at the two sites with the best potential;
   - Developing a full financial analysis and pro forma for the site we feel is the best option for pilot implementation in the Great Lakes basin, outlining a set of issues affecting the site, and identifying critical parameters and benchmarks for moving forward.
3. **We generated legal and financial frameworks for operationalizing the Forest Bank in the pilot stage.**
4. **We created a clear sense of the core business operations that a Forest Bank must undertake to be successful financially and ecologically.**

Our analysis leads us to believe that the best place to pilot a Forest Bank in the Lake States is on the Wisconsin/Michigan border in a site that would begin with the Kakogan and Bad River watershed. This site would likely also encompass over time the western counties of Michigan's Upper Peninsula (in a potential cooperative effort with the Western Upper Peninsula Forest Improvement District) and the Land-o-Lakes district on the border of both states. We feel no other sites present a good potential to pilot the Forest Bank concept, though a handful of sites show potential in future if the pilot sites prove successful.

The potential exists to implement The Forest Bank in a second site around the Tug Hill in northern New York. There are some key conservation infrastructures that need to be developed still, so it is not a good place to pilot the Bank concept. Over time, as the Conservancy is able to build its presence on the Tug Hill, we believe Forest Bank could be a good strategy for conservation there.

It will be extremely important in moving the Forest Bank concept forward that we pilot the concept at the three or four sites with the very best potential for success. Early success will help us build the concept into a national program for the conservation of working forest lands. In this sense, the implications of our feasibility analysis have gone beyond the Great Lakes basin to encompass all of the potential sites we are exploring for implementation, and our interest in committing to implementation in the Kakogan project depends on its relative likelihood for success when weighed against other sites nationally.

It is clear to us at this point is that The Forest Bank is a concept with great potential that should be implemented and grown. The support of GLNPO has helped us to build the business concept and clarify our expectations and requirements. It has materially advanced our efforts to develop a market-based tool for forest protection and to assess sites for their feasibility. Whether or not it leads us to pilot testing in the basin itself, the feasibility work has clearly given us a handful of potential sites for expansion if and when we prove the concept in the pilot phase. For these reasons, we feel the project has been very successful.

REPORT ON WORKPLAN OBJECTIVES

Phase 1: Choosing the Test Sites

CCED created its list of potential sites in the Great Lakes basin using a three-phase approach. First, we stratified based solely on scientific, conservation, and ecological criteria. In this initial phase, we contracted with the Great Lakes Office of TNC to identify a suite of sites in the U.S. part of the Great Lakes basin that had the following criteria:

- Large forested tracts;
- Species, natural communities, or aquatic systems that were dependent on that forested acreage and contained highly ranked (rare, threatened, or endangered) examples of biological diversity;
- Critical tracts of matrix forest that were unique in and of themselves for their particular ecoregion.

This analysis drew largely on available Heritage data and produced a list of 24 sites throughout the basin. After studying their report, it was our feeling that:

> First, the results were biased toward small sites, and there were at least four sites presented that because of size were prima facie not suitable sites and were eliminated.
>
> Second, the dependence on available Heritage data created a list of sites that were based too much on the rare species/communities criteria and that may have missed important matrix forest landscapes.

We believe this was largely a result of the historical focus of the Heritage network on single species conservation. Ecoregional planning that was just beginning at the time would have helped us focus on larger matrix forest landscapes, but results of that planning effort are only now becoming available.

To compensate for the lack of a suitable information base through Heritage, CCED invested significant staff time in looking for additional potential sites or for "growing" the unsuitable sites given to a size compatible with our expectations. This was done through the network of the state field offices of the Conservancy, through contact and site visits with landscape project offices in the Lake States, and through extensive contact with TNC conservation partners. Through these efforts, we added additional sites or expanded the unsuitable sites identified by Heritage to bring our total for potential U.S. sites in the basin to around twenty-seven, all of which met our criteria for conservation need to some extent.

In addition, we combined some of the single sites into a complex of sites, or megasite. For example, the "Oak-Pine Complex, Northern Lower Peninsula, MI" included five smaller sites that had been identified separately by the Great Lakes Office work. These five sites (NW Montmorency County, Four Corners site, Southern Crawford and Oscoda Counties, SE Roscommon, and Upper Muskegon River) all shared similar timber types and land ownership patterns, would depend on the same timber markets and outlets, and—most importantly—could potentially operate from a single center because of their relative proximity geographically. Thus, we felt they should be assessed as one potential Forest Bank. Similarly, we combined three sites on the western edge of the Adirondack Park in NY to create the Tug Hill complex. In a third case, we decided once we were well into the analysis of the Kakogan-Bad River site in Wisconsin, that it should also include the Land-o-Lakes site and the western Upper Peninsula site.

For all of these megasites, we identified the core site where we would begin operations and concentrated our analysis on that site. The reasoning behind this choice was that any Forest Bank operation would begin in a core area and, as it showed success, would expand to encompass additional areas. Thus, it would have to work in the core site first.

Phase 2: Prioritizing sites for further analysis

The second phase of the analysis required us to look at the financial and logistical aspects of each site and to eliminate those sites that seemed unlikely to be successful. This work was done by the project manager, with support from CCED and a small group of advisors. The logistical criteria were developed based on expectations created by analysis of other potential sites in Virginia and Indiana, and were informed by detailed financial models developed by Mater Engineering and CCED. These criteria at the beginning of this second phase were as follows:

- A minimum of 50,000 acres of private, non-industrial forest in the target site;
- Sites where the Conservancy has a strong conservation presence (office or staffed preserve) or a commitment to establish a presence (site conservation plan);
- A clear connection between conservation goals and the potential for protecting working forests;
- An existing timber industry infrastructure where forest products are the primary income from forest land (to avoid sites with high land values due to speculation);
- Average parcel sizes of 100-200 acres.
- The potential for deposits of much larger parcels of timber producing lands (5000+ acres).
- Forest types biased toward high value sawlogs and veneer (as opposed to pulp production systems).

We then gathered detailed information about all 27 sites from our contacts in TNC, from state foresters and other conservation organizations, from timber industry contacts and forest consultants, and from the Forest Inventory Assessment (FIA) of the US Forest Service. In a number of instances, we consolidated sites that were linked geographically or ecologically into a single, larger complex, or megasite.

First Tier Sites

Tug Hill Forest complex (3 sites), NY

Kakogan-Bad River, WI

Western U.P., MI

Second Tier Sites

Land-o-Lakes, WI

Lake George-Lake Champlain Valleys, NY

Tri-counties, Eastern U.P., MI

Oak-Pine Complex, Northern Lower, MI (5 sites)

Huron Mountains/Michigamie Highlands, MI

Western Finger Lakes, NY

Third Tier Sites

Whitefish Point, MI

Delta/Menominee Counties, MI

Oak/Pine Barrens, Lower Peninsula, MI

Allegan S.G.A. region, MI

W. Oakland County, MI

Blueberry Swamp, WI

Lower Wolf River, WI

Millhome Forest, WI

Door Peninsula, WI

Baraboo Hills, WI

Zoar Valley, NY

Frontenac Plate/North Flow Adirondacks, NY

LaPorte/Porter Counties, IN

This preliminary analysis helped us to eliminate 13 sites (tier 3) from further consideration because they clearly failed to meet more than one of the criteria listed above. The remaining sites were then examined much more closely with site visits to most of them, discussions or contacts with consulting foresters and/or landowners in the sites, and more in-depth analysis of the existing data on their forest resources.

During this phase of the analysis, we divided the remaining nine sites into two tiers. First tier sites were those that we felt had the most potential for pilot implementation of a Forest Bank. Second tier sites had some identifiable obstacle to success which meant it was not worth further analysis at this point but may be worth coming back to in future when The Forest Bank has proven its viability at other pilot sites. Third tier sites were clearly unsuitable now or in future. A fuller description of first and second tier sites is located in Appendix A.

At the end of this analysis, the Kakogan, Western U.P., and Tug Hill sites clearly were the best places to push forward with an in-depth forest analysis. As stated earlier, we realized as we began this analysis and met with landowners in both Kakogan and the Western U.P. that the two should be combined and considered as a single site operationally, with the Kakogan-Bad River area forming the core of operations. Therefore, we chose to analyze forests at the two sites—the Kakogan-Bad River watershed and the Tug Hill complex. We felt the following characteristics made these two sites stand out.

The Kakogan-Bad River watershed is roughly 678,000 acres with around 150,000 in non-industrial private forest (NIPF) ownership. It supports a healthy sawtimber and veneer market with its hard maple, but also has excellent access to multiple markets for its lower grade pulp wood. It has a staffed project office, an enthusiastic and skilled project director, and a good conservation plan.

Tug Hill is a matrix forest site identified in the recent "Boreal-Northern Appalachian Forest Ecoregion Plan." It lies on the west edge of the Adirondack Park and serves as the watershed for three rivers that feed eastern Lake Ontario's dune and fen system. It contains a large (50,000 acre plus) roadless area, surrounded by concentric rings of increasingly more fragmented forest and farmland. With proximity to the Adirondack Park, the site could potentially attract some large acreage Park inholdings which could become "anchor" properties for a Bank operation.

One of the important indirect benefits of this early feasibility work is that we have been able to refine our preliminary site assessment criteria and clarify how to measure them simply. With funding from another source, we developed the attached booklet, ***The Forest Bank Site Assessment Guidebook,*** which we have used with multiple projects around the country as a preliminary feasibility analysis. This effort has allowed us to cut the cost of feasibility testing for any given site to about 40% of the cost for the first few sites. An excerpt from the ***Guidebook*** is included below. The full guidebook can be downloaded from our website.

Five Key Measures of Site Readiness

❖ TNC Project Director (or equivalent with partner organization)

There must be a coordinating individual with strong leadership skills and enough experience locally to handle the multiple demands of participating in a business start-up while managing day-to-day operations.

❖ Site Conservation Plan

The project site must have completed a clear and compelling strategic plan that identifies the long-term conservation targets of the project and its forests, the priorities of the project in meeting those goals, and—most importantly—the way that protection of working forests fits within those goals. The site conservation plan allows us to address big questions such as the threshold for meeting any defined ecological goal and potential measures of Forest Bank success. In particular, project directors should give adequate thought to identifying the constraints under which forest management and timber harvesting must operate, and be able to articulate a conception of ecological best management practices.

❖ Sufficient Non-Industrial Private Forest (NIPF)

In our analysis, we will look closely at the forest types within the project area and the overall quality and quantity of resource within those forest types owned by non-industrial private forest owners. Public and industry-owned land are not part of our target market in general. Although there is no clear threshold acreage, ie. the minimum total NIPF pool is a function of total acreage and quality of the timber resource, our best guess is that the Bank requires a minimum of 40,000 to 80,000 acres of non-industrial private forest from which to draw its potential depositors.

❖ Quality of Existing Forest Resource

The Forest Bank must produce long-term yields of sufficient value to generate revenues that can meet our financial obligations to timber depositors and financial investors. While we can accommodate some poorer forest quality and sites, in general the value of the timber deposited must be high enough to overcome the landowner's reluctance to give up permanent control over how their forest is managed. In simple terms, we are asking them to give up a lot—permanent control of their land's management—and it must be a good financial deal. Thus, in general the timber should contain decent value, geared toward sawlog production, on relatively productive sites.

❖ Compatible Land Use Trajectory

A speculative land market is not compatible with a Forest Bank because the Bank requires landowners to commit to permanent forestry. Landowners who could sell out to development have to give up too much in potential gain for the underlying development rights to make the income based on the timber values alone attractive. Intuitively, we feel that forested areas facing major development pressures are not good candidate sites for a Forest Bank. Our target market must be willing to commit to permanent working forests as the highest and best land use for their parcels.

From **The Forest Bank Site Assessment Guidebook**

Phase 3: Forest Feasibility Analysis

One of the difficulties with assessing the forest resources in our potential sites was the sheer scale of the project areas. It would have been cost-prohibitive to do any timber inventory work ourselves, so we had to find and rely on existing data sets, supported by the experience of consulting foresters who intimately knew the regions we were analyzing.

To assess Forest Bank feasibility, we needed four sets of information. First, we had to know what our likely timber yields might be from a set of lands that would be deposited in a Forest Bank at the site. Second, we had to know what the market value of those products would be. Third, we had to put those together with estimates of costs and expenses to see if a Forest Bank was viable. Lastly, we had to gather information from and about our target market, the landowners.

Our strategy was to analyze the existing forest across the given site and to create from this a model of the potential types of forest, their quality and quantity, and their relative density on the landscape. As an example, we might identify that, on Tug Hill, mature maple beech forest with a basal area of 110 and 20 cords of wood represents 20% of the total target forest acreage. We would type the rest of the target acreage using similar qualifications, and in this way create a model statistical forest for the project site.

Once the model statistical forest was constructed, we could use existing growth modeling software to "grow" and harvest the forest according to our guidelines for sustainability. This gave us per acre per year timber yields of sawtimber and pulpwood for each of the stands, which can then be translated into revenues in our Forest Bank economic model. The creation of multiple stands or timber types also allows us to vary the types of deposits that we might target and test the sensitivity of timber types as a factor in economic viability.

In this process, we found that the only reliable source of information for this work is the FIA data from the U.S. Forest Service, but that it was critical to augment the FIA data with local experience and ground truthing. Therefore, we hired forest consultants with experience in forest management and modeling and asked them to complete the forest and timber price analysis. In Wisconsin, we chose Tom Hittle of Steigerwaldt Land Services as lead consultant, and in New York we chose Robert Turner and Todd Caldwell of R.J. Turner Company as lead with support from Shanna Ratner at Yellow Wood Associates. The results from Steigerwaldt and Turner are included with this report as Appendix B.

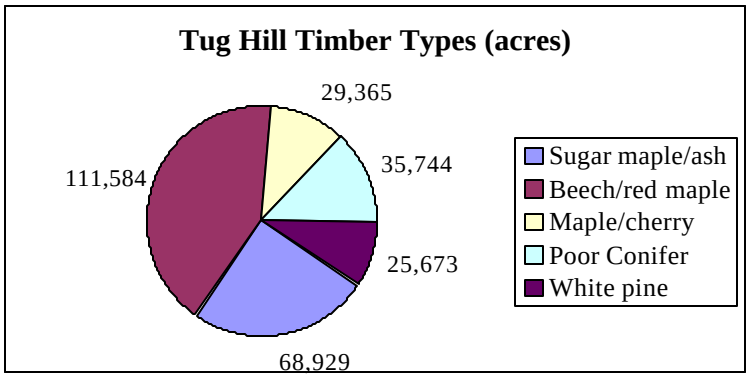
Highlights of the Forest Analysis: Tug Hill

The Tug Hill is a large tabletop plateau with gentle slopes on all sides. It was our belief that the area which represented the core forest lay to the south of the hill and formed the watersheds of the Salmon River and Fish Creek, that it was predominantly privately held and contained the high quality timber. We initially thought industrial ownership was concentrated on the plateau, and that the northern slopes of the hill were too fragmented with farms to be worth pursuing. We therefore focused our initial analysis from the plateau south and west to capture the watersheds of the Salmon River and Fish Creek.

One of the key issues for the Tug Hill analysis was the relative paucity of data points in the FIA system. A majority of the data points on Tug Hill fall on industry-owned land. This meant that we were trying to construct model statistical forests for the NIPF ownerships based on a data set that was too small to give us sufficient statistical confidence in their accuracy. In addition, it was apparent from site visits that the resource on industry lands was sufficiently different from the resource on non-industrial ownerships, that we could not use the industry-owned data set to confirm our results.

Because of this, we had to rely very heavily on support from a group of foresters with long experience on Tug Hill. This included state foresters, private consulting foresters, and foresters who worked for industry. We invited this group to a meeting in Syracuse, NY to review our findings to date and comment on our characterization of the model forest. It quickly became apparent to us that what was commonly referred to as the "core forest" was centered on the plateau, and that this area was in a mix of private and state lands, but the area to the south of the plateau, which represented the best and most consistent timberlands, was concentrated in the hands of large industry ownership, predominantly Hancock Timber Resource Group and two others.

The plateau itself is characterized by perched soils with very poor drainage and short, stunted trees with poor form (mainly due to extremely high snow loads). The slopes off the plateau in all directions contain the better timber on moderate to good sites. It is also clear from Turner's analysis, that the NIPF land is highly variable but does contain some very good quality sites.



We built a GIS based analysis that overlaid timber types, topography, and ownerships (industry, state, NIPF). A copy of the map is attached as part of Turner's report. This information and the need for more NIPF data points prompted us to redraw our boundary to try and capture sufficient NIPF acreage to meet our pre-requisites of minimum 50,000 acres, and to include the watershed of the Deer Creek headwaters.

The total size of the project area after redrawing the boundary was a little over 800,000 acres, with the total NIPF ownership being around 270,000. According to the FIA data, roughly 36% of the NIPF land is in a desirable timber type (hard maple/yellow birch/cherry). The rest is either converted old-field, immature or heavily cut timberland, or timber of less desirable cover types, such as red maple/beech (40%). Discussions with the consulting foresters suggested the FIA data may overestimate the quantity of beech/red maple, and that hard maple may constitute as much as 45% of the NIPF ownership.

Matching the stand types and acreage for our desirable timber types to the harvest projections created by Turner, we found that only about 30,000 acres of NIPF land were in a desirable timber type and would produce significant harvests in the 30 year analysis period. The beech/red maple timber types would produce yields on an additional 70,000 acres of NIPF land. However, values for beech are essentially nil and for soft maple are significantly lower than hard maple. In addition, these timber types tend to indicate much poorer sites in terms of productivity and the potential to improve future yields.

This analysis raised a serious question about whether there is enough of our desirable timber type to create a viable bank and have an impact on our conservation goals. This was compounded by the timber market and price analysis conducted by Turner and Yellow Wood Associates.

Timber Markets and Pricing: Tug Hill

The timber market analysis for upstate New York identified a number of critical issues in addition to giving us current market prices and an analysis of historical trends in price appreciation. In short, these were:

- There are decent local and regional markets for sawtimber, including a number of furniture and sporting goods manufacturers;
- Markets for pulpwood are limited and are likely to disappear over time with most pulp and paper producers being pushed out by high energy costs and taxes in New York;
- A conservative analysis projects any pulpwood harvests in the near-term as a break-even proposition. This was confirmed by CCED conversations with local consulting foresters and NYS DEC foresters.
- In the future, the problem of moving low-grade material is likely to grow worse with an increasing difficulty in moving pulp wood at all. Timber stand improvements could become uneconomical;
- The revenues from sawlog production would have to carry a Forest Bank on Tug Hill;
- Sugar maple, yellow birch, and—to a much lesser extent—black cherry are the key species for Tug Hill.

Market Landowner Analysis: Tug Hill

We met with landowner groups, individual landowners, government agencies, and members of land trusts who owned property on the Tug Hill to assess their goals and options. In particular we probed at their long-term goals for owning property on Tug Hill, their expectations for a return from their timber, their concerns about their current options, and their sense of the value of their timber alone and their land including the timber.

One of the key findings from this was that land on Tug Hill in general had a low value. Bare land values averaged around $150 to $250 per acre. Timber property with average timber stands only cost $250 to $400 to purchase fee title, and sometimes less if the parcels were large. The reason this is important is that the marginal value of the timber, as expressed by the landowner and—we assume—valued by the market, is low. The importance of this is two-fold.

First, landowners may not get a very high return in exchange for giving up permanent control of their forest asset. For example, a landowner who gets a timber value of $200 per acre and owns 40 acres only has an asset in The Forest Bank worth $8,000, which pays a dividend at 3% of $240. We questioned whether that was enough to convince a landowner to forego the option of ever developing their land, clearing it, or managing it themselves.

Second, the marginal cost to the Conservancy of acquiring fee simple on sufficient acreage to meet its conservation goals may not be prohibitive when weighed against the cost of creating and servicing a Forest Bank that only controls the timber rights. There are potential risks in only owning the timber rights. In a simple example, if the goal of the Conservancy was to protect 30,000 acres of matrix NIPF land to augment its work with state ownership and easements with the industrial owners, the cost of fee acquisition might be $9 million (30,000 acres times $300/acre). In contrast, the liability of that same acreage for the Forest Bank would be around $6 million (30,000 acres times $200/acre). Since the Conservancy could presumably generate income itself from land it purchases, the $3 million in added upfront costs for complete control of the properties may be worthwhile.

The interviews on Tug Hill also indicated a significant percentage of landowners who were and wanted to remain involved in the management of their timber. This was a red flag because our target market has always clearly excluded people who own the land with timber management as a primary goal of ownership. We expect that owner-managers, which nationally is about 5% of NIPF owners, will not want to give up control to someone else. While our analysis may have been biased by the reliance on individuals identified by timber owners associations, it nevertheless signaled an important difference from other sites we have analyzed.

Preliminary Economic Feasibility Analysis: Tug Hill

Prior to investing significant effort in developing a pro forma and business plan, we did a preliminary economic analysis of both Tug Hill and Kakogan-Bad River. The idea was to use the existing data about timber yields and prices and compare those to data we had gotten from landowners about land and stumpage values to calculate: 1) whether it seemed like we could offer a fair value to landowners; and 2) whether a Forest Bank option made more sense for the Conservancy than some other form of protection at the site.

In the Tug Hill, we focused this preliminary analysis on the most desirable timber types of sugar maple/ash and sugar maple/cherry (as defined by Turner from the FIA data). It was our assumption in choosing these that sawtimber stands would carry the bank and that, although the red maple/beech stands do produce sawtimber, both are low-value species with high cull and pulpwood rates. We assumed that if the Forest Bank concept cannot work using the best potential forest as the sole source of deposits, it certainly would not work with a mix that included worse timber types.

In the chart below we break out our preliminary analysis of Turner's results for the sugar maple timber types. Turner differentiated his model stands by three qualities: timber type, financial maturity, and stocking density. Each of these represented a certain amount of NIPF acres on the Tug Hill. We calculated the clearcut value by taking the initial volumes and multiplying these by the species specific prices for sawtimber and pulpwood. An important note is that the "clearcut value" does not account for any harvest costs or for a consulting forester. Essentially it is based on raw stumpage values and so may be somewhat high.

The "Per acre per year return" is the 40 year average from our projected management of the stand, essentially taking volumes harvested for each species multiplied by stumpage values (uninflated in this case) and averaged. The discounted cash value of the acres is a rough estimate based on a 30-year projection of even cash flows using a discount rate based on our projected cost structure for the bank. It is important to point out that we realize this was a rough analysis, but it pointed out a few important issues.

First, it is apparent that the bottom three stands are unlikely to translate to deposits in the bank. Essentially the low stocking density and financial immaturity give these stands very low valuations. We don't believe, based on our interviews with landowners, that the returns to landowners are sufficient to overcome their reluctance to deposit. In essence, this confirmed one of the anecdotal conclusions of our market analysis of landowners.

Timber type	Financial Maturity	Stocking density	Total Acres	Clearcut value (per acre)	Disc.cash flow value*	Per acre/year return ($)
Maple/Ash	Mature	Well stocked	5231	$ 1,614	$ 430	$ 41.87
Maple/Ash	Immature	Well stocked	41130	$ 1,412	$ 184	$ 17.90
Maple/Cherry	Immature	Well stocked	8800	$ 1,401	$ 189	$ 18.44
Maple/Ash	Immature	Moderate	22568	$ 561	$ 51	$ 5.08
Maple/Cherry	Immature	Moderate	15085	$ 540	$ 50	$ 5.01
Maple/Cherry	Immature	Understocked	5480	$ 18	$ 5	$ 0.44

On the other hand, the first stand listed "Maple/Ash—Mature" represents a huge variation from the norm and only about 5,000 acres of NIPF land. Because the model forest construction was based on only about 45 plots in the FIA data (the majority of FIA data plots on Tug Hill are located on industry or state-owned property), we were concerned that this stand could represent an anomaly from a single data point.

Removing the first stand in the table and the last three from consideration, we are left with about 50,000 acres of sugar maple dominated northern hardwoods that might generate enough value for landowners to consider a deposit. One of the toughest issues in characterizing the NIPF ownership on Tug Hill was the low number of data points, and thus we felt it was important to ground truth our theoretical analysis with site visits.

Our visits to Tug Hill and our consultations with local foresters who work the hill allowed us to make a number of observations. These tended to confirm the concerns that were raised by the model forest and our own subsequent analysis:

- The consistency of the industrial land does not carry over to the NIPF land, which is highly variable and fragmented.
- NIPF forests contain some good stands, but in general look as if they have experienced high-grading in the past that has left a high proportion of low-value species like red maple;
- The percentage of cull trees is probably higher than the FIA data suggests;
- Across the NIPF land, a 25% sawtimber harvest is optimistic, but the average value could easily be lower. This means 75% or more of all harvests will be pulpwood;
- Even productive sawtimber stands are characterized by short boles and candelabra tops (characteristic of the 300+ inches of snow, and ice loads and breakage).
- The northern quarter of Tug Hill experienced a major ice storm that devastated timber stands there in the last three years.

Conclusions: Tug Hill Analysis

1. The Tug Hill on average has a mediocre forest resource with a range of productivity. The degraded resource is caused primarily by poor past management.
2. The southwestern edges of the hill may be facing decreasing productivity due to acid deposition.
3. Selective hardwood management is not a favored silvicultural system on Tug Hill.
4. The resource on Tug Hill is degraded enough that our management regimes pushed us toward getting the stand to an early rotation age, followed by a regeneration shelterwood harvest that clears the overstory.
5. This means that our projected per acre per year yields from Turner are inflated for some key stands by a heavy cut at the end of the period.
6. Average timber values are low on the hill, which means selling deposits in a Forest Bank may be difficult because of low returns to the landowner.
7. Tug Hill land values also seem very low and not much higher than discounted values for timber, which suggests that for a marginal increase in cost we could aggressively acquire fee simple ownership on Tug Hill, rather than pursue acquisition of timber rights for a Forest Bank. Land acquired could still be managed for timber production, if that is consistent with the conservation goals;
8. The lack of a staffed TNC presence and history on the hill is a significant deterrent from further action at this point.

For these reasons, on balance we felt Tug Hill did not present a good alternative as a pilot site for a Forest Bank and we ended the analysis at this point.

Conservation Recommendations: Tug Hill

These recommendations are ancillary to our feasibility analysis but are included in the hopes that they might inform future conservation efforts at this site.

- The highest leverage conservation options for protection of Tug Hill do not lie in the Forest Bank model of consolidating management of small NIPF ownerships. Rather, TNC should concentrate on the large, industrially-owned tracts (particularly the 50,000 acres owned by Hancock Natural Resources Group) to ensure that they are managed in alignment with conservation goals for the site. The best option is to secure an easement protecting the key conservation targets but allowing future sustainable timber management or to acquire these parcels outright;
- The second most important ownership group is the state of New York. Similar to the Hancock land, TNC should pursue landscape management that is consistent with site conservation goals. Compatible management of state land and Hancock ownership would protect 75% of the most important, roadless sections of the matrix forest;
- TNC should consider aggressively pursuing fee simple acquisition of the larger tracts of NIPF land or the smaller industrially-owned parcels on Tug Hill.
- Since we found public opposition to preservation is likely to be an issue, TNC should develop ways to keep these acquisitions in timber production. Given the importance of the site to the Conservancy, management of The Forest Bank at CCED would be willing to aid or oversee Conservancy efforts to develop forest management systems with outside forest management groups;
- Assuming pilot efforts of The Forest Bank are successful elsewhere and once the Conservancy has developed a presence on Tug Hill and perhaps acquired a number of key parcels in fee, we might try to leverage the TNC stake into a Forest Bank with the Conservancy itself becoming an initial depositor.

This said, a Forest Bank on Tug Hill only really makes sense if the industrial and state ownerships are securely managed in a manner compatible with protection of the site conservation goals. They form a ring, the hole of which is primarily NIPF land. Once the ring is adequately protected, Forest Bank could be a good conservation tool to protect the inner core.

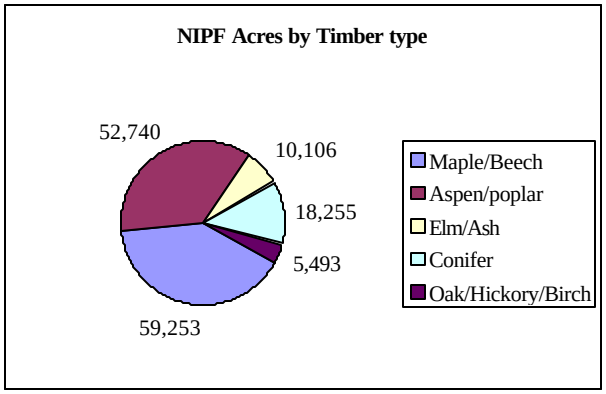
Highlights of the Forest Feasibility Analysis: Kakogan-Bad River

Based on aerial photography and the experience of the project director, we expected to find a sharp delineation following the topography of the watershed. In the flat clay plains of the lower watershed, we expected and found a predominance of aspen stands of variable quality. This land has been primarily agricultural or is managed for large-scale aspen pulpwood production. The agricultural land is slowly reverting to old field/aspen forest as the last few farms go out of business.

We expected that the higher elevations to the south and east and into the hills of the Iron Range would carry much higher value maple stands with fairly continuous forest cover and sawlog quality or potential. This upland represents the headwaters for the Kakogan-Bad River watershed and the maple forests that cover them are our target area for a potential Forest Bank.

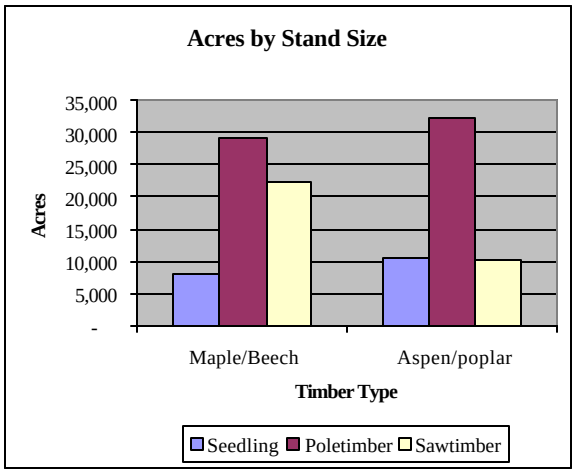
Total acreage in the watersheds is around 450,000 acres, and NIPF ownership is around 145,000, or 29% of the watershed. Significant other owners are the Bad River tribe, the Chequamegon National Forest, county forests, and the timber industry. In addition, US Steel owns significant acreage in the hills.

Of the NIPF acreage, 41% is maple/beech hardwoods (This stand type is dominated by sugar maple. The timber type name is a USFS designation, but in northern Wisconsin the beech tends to fall out of these stands). About 36% of the NIPF land is aspen. Surprisingly, conifer timber types (determined by dominant species) account for less than 12% of the NIPF land, according to our FIA analysis, though an important conservation goal of the Conservancy is to restore a much higher proportion of conifer to the existing stands.



The chart at left illustrates one of the initial concerns that arose from our forest resource analysis. Given our assumption that the desired long-term alternative for sustainable forest management and protection of the Kakogan-Bad River watershed is selective harvest of hard maple climax forests, the total acreage from which we can draw within the watershed is limited. Total NIPF maple/beech type forests in the watershed are only 60,000 acres, which is over our threshold but close enough to be a concern. Aspen/poplar represents a significant proportion of the remaining NIPF land, but this is a pulpwood system that does not fit well within the Forest Bank business model.

If we break down this acreage further and analyze the stand size of the two dominant timber types, maple/beech and aspen/poplar, we find that the majority of the acreage is not at a mature stage for a sawtimber harvest. Over 62% of the maple beech is in sapling or poletimber size classes, which means that under optimal management from the Conservancy's point of view, it is 10-40 years from being able to support regular, sustainable, selective harvests. In the interim, it will require timber stand improvement cuts that will not provide significant cash flow.



In addition, site visits by the project team showed that the "average" stand of maple hardwood in Kakogan is roughly even-aged, or at best two-aged. If the average maple stand were uneven aged, with 38% of the standing volume in a sawtimber size class, we would be able to project regular (12-15 year) entries and a fairly uniform cash flow. Instead, we find the maple forest divided into two types: 1)generally well-stocked, even-aged sawtimber stands; or 2)understocked, even-aged poletimber or sapling stands.

Scattered throughout these maple forests are pockets of mixed hardwoods, which tend to be on wetter soils. Our estimation based on a GIS analysis was that as much as 15% of the northern hardwood stands contain these pocket wetland forests, and our decision was to project no harvesting in these areas because of concerns over harm to conservation goals. In addition, our GIS analysis of watercourses coupled with our management recommendation of 35 foot setaside zones on intermittent streams and 100 foot setasides on perennial streams and lakes caused us to further reduce projected yields by 3%. Thus, all of our projected harvests in the hardwood systems were reduced across the board by 18%.

While the quality of these hardwood forests is better than at Tug Hill, site visits by CCED and TNC staff and ground truthing by our consultants further showed us that these forests have seen multiple entries during this rotation, and the management has often been to the detriment of the overall timber quality. On average, harvests of the well-stocked, sawtimber, hardwood forests since 1960 tended toward high-grades or diameter-limit cuts. A comparison of the average NIPF stand in northern Wisconsin with an exemplary managed forest like the Menominee Tribal forest clearly highlights this. The result is a degraded resource with a high proportion of cull or pulpwood in a system that should be producing primarily sawlogs.

We found that even in the well-stocked sawtimber stands, a significant proportion of the mature timber would not produce the highest grade lumber where the real economic value is located. Our analysis shows that in the average well-stocked maple stand as little as 25% or less of any sustainable harvest would produce grade lumber for the first harvest. The rest is cull or pulp. Future harvests will improve that ratio as our management removes the poor quality trees in favor of growing higher value stumpage. But improvement cuts are likely to dominate the first 20-30 years.

This means that nearly 75% of all wood produced from our deposits will be pulpwood. As a comparison to two other sites where we are moving forward with pilot Forest Banks, Clinch River in Virginia would produce 50% sawtimber initially from a harvest, and Blue River in southern Indiana would produce greater than 75% sawtimber.

The implications of a degraded initial resource are:

1. A significant proportion of our deposits may not be ready for harvest for ten or more years, which has severe implications for cash flow given our conception of the dividend payments to landowners;
2. Good, long-term management regimes as defined by Steigerwaldt and CCED would focus on improving the quality of timber to aim for a much higher percentage of acceptable growing stock and grade quality sawlogs. In essence, we would try to flip the pulpwood-sawlog ratio so that our future forest would provide at least 75% grade timber or veneer from regular, selective harvests.
3. This means that most of the accumulation of value within the 30-year analysis period *remains on the stump*. ie, selective harvesting of very high value sawtimber in decent quantities is 30 years away. The interim harvests are more on the order of timber stand improvement cuts and produce only moderate revenue.

At the same time, the volume of poletimber dominated stands may present an opportunity. Timber appreciates in two ways. It accumulates growth annually (at a rate in Kakogan or Tug Hill of perhaps 3%), and it moves up in size classes. In terms of the latter, a well managed maple tree goes from pulp wood (average value = $30/MBF), to small sawtimber (avg. value = $100/MBF), to quality sawtimber ($400/MBF), to veneer ($1000+/MBF).

Shrewd timber operations acquire timber that is going to jump a size class in the near future (10-15 years), and thereby capture the significant increase in value above the annual growth that accrues to that stand. This is how a timber investment management organizations (TIMO) is able to project 8-10% returns for their pension fund investors. They are also able to do it because most of them schedule a complete liquidation of the timber value over 16 years on average.

A Forest Bank in Kakogan could capture the same dynamic by targeting poletimber of high enough quality that it will produce a valuable return when it moves into the sawtimber size class. The key issue, however, is that in the interim we will have significant costs relating to payments to landowners and amortization of the timber liability represented by the deposit.

The initial forest analysis raised two important issues:

- First, is there enough high quality timber in the uplands to build a Forest Bank with sufficient economies of scale to be viable?
- Second, can we create alternative deposit options that decrease payments to landowners in the lean early years in exchange for larger returns later.

Timber Markets and Pricing: Kakogan-Bad River

Steigerwaldt Land Services did a very thorough analysis of timber markets as part of their work for us. In addition to identifying all of the important outlets for pulp and sawlogs locally and regionally and surveying for stumpage prices, they also conducted a historic regression analysis to give us a sense of pricing trends and a range for future projections.

As part of their look at local and regional markets and market factors, we noted the following important points:

- There are excellent and competitive markets for sawtimber, and there are numerous manufacturers in the region, particularly for flooring and cabinetry.
- Unlike almost every other place we have analyzed, currently there are strong markets for pulpwood, and forest types with high pulp content do hold value;
- Thirty-year price regressions for sawtimber suggest real price appreciation of 3% or more, but price increases in the past ten years have significantly inflated that figure;
- A conservative estimate for pulp is for little or no price appreciation, and it could easily undergo price depreciation, particularly as highly productive, southern hemisphere eucalyptus and radiata pine plantations come on-line in the next few decades and local or regional mills are closed.
- In the interim, we may have a window in which pulp revenues could fund some aspen/poplar deposits on productive sites with the goal being to move these into mixed hardwoods over time;
- Northern hardwood is our target timber type, and sugar maple is our bread-and-butter species.

Market Landowner Analysis: Kakogan-Bad River

During the preliminary analysis of the Kakogan project, we organized a week of interviews and focus groups both in northern Wisconsin and the western U.P. The focus groups were conducted by CCED and an independent facilitator. The market analysis included:

- one-on-one interviews with landowners identified by the project director;
- presentations to landowner groups and timber associations;
- facilitated focus groups with landowners and foresters.

All of these efforts involved the presentation of the concept, explanation of the details of how it would work, and then a focused discussion and questions to assess interest. Our conclusions were as follows:

1. There is a very strong hesitation to "give up control" of the timber management permanently. Although this is a constant in all places we have tested the concept, it was stronger in this region and—we thought—may represent a relatively short history of TNC involvement in these communities.
2. Awareness of The Nature Conservancy and its goals was very low and viewed with some suspicion.
3. The area contains a high level of absentee landowners and, though our test sample was underrepresented by absentees, many who participated felt the concept would appeal to absentee owners best;
4. Overall, we estimate about 70% of the participants as viewing the concept favorably.
5. The 30% that clearly would not consider a deposit in the Bank are often intimately involved in timber management operations themselves. This group does not want to give management control to someone else;
6. Landowners involved in the focus groups generally felt they had a good sense of what their timber was worth (which is very different from other sites we have tested).
7. The two most important factors cited as reasons for interest in the concept—value of the timber being deposited and the guarantee of good management—are equally important to landowners who were positive.
8. At the same time there is less of a commitment to conserving forest for environmental or aesthetic reasons than to preserving a timber-based economy and way of life. Clearly the message for this area is "Protecting Working Forests" rather than "Sustainable Forestry."

We subsequently completed an in-depth survey of a small group of typical forest landowners in the Kakogan-Bad River watershed. In this survey, we offered to do timber cruises, or appraisals, of their timber in exchange for their willingness to consider The Forest Bank as an option and to discuss with us their reasons for being interested or not interested. The key benefit of this analysis was that it allowed us to give actual values to landowners, and solicit their responses based on a "real" set of economic choices.

The full report is attached in the Appendices. In short, we identified a "target market" of 68 landowners in three distinct sites, based on a list of forest owners generated from remote sensing using aerial photos. Of these landowners, we were able to personally contact 26 owners within a reasonable time period. Eighteen agreed to forest resource assessments, and we were able to conduct follow-up interviews with 17 of those landowners.

The results are compiled in the following table. The positive response rate in northern Wisconsin was as high as we have experienced anywhere. Of the 17 landowners interviewed, 10 expressed an interest in becoming depositors, and a number of those expressed a strong desire. Another four landowners expressed an interest but said they would need additional information before they could form an opinion. This represents roughly 15% of the total "target market" that was interested in becoming depositors, with 62% of the market not personally contacted.

Predominate Characteristics of Landowners	Interested N=10	Not Interested N=3	Undecided N=4
Age	20's to 70's	40's to 60's	40's and 50's
Average Acreage	113.56	66.67	110.00
Average Timber value	$51,448.83	$20,417.67	$47,242.88
Ave. Value/Acre	$707.10	$471.04	$501.85
Purchased Land	100%	100%	100%
Interaction with forest	Much	Moderate	Moderate
Goals for forest	Conservation; Sustainable harvest	Forestry; Sell	Recreation; Leave land to children
Want long-term protection	Yes	Not of high importance	Yes
Sold timber before	80% Yes	100% Yes	25% Yes
Timber value estimate	8 below; 1 no idea; 1 at appraisal	1 above; 2 below	2 above; 2 below
Benefits liked	High Standards of forest management	Access to timber value	High Standards of forest Management
Concerns	Loss of their ability to control forest management	Loss of control	Loss of some recreational potential; concerns of restricting future generations use
Can we re-contact	Yes	Yes	Yes

Sample size = 17

Preliminary Economic Feasibility Analysis: Kakogan-Bad River

Steigerwaldt created four stand types that they felt characterized the forests of the Kakogan project area. These were well-stocked maple, moderately-stocked maple, aspen, and mixed hardwoods. We developed with them management regimes for the first three. As stated before, we assumed no harvesting from the pockets of mixed hardwoods.

Based on Steigerwaldt's projected timber yields for the three productive stand types, and based on their prices per species, we created a spreadsheet (see Appendix C) which generated the table below. To get a very simple sense of the offer we could make to landowners, we compared two different values. First, we generated a "clearcut" value for the stand represented by each type (all values are per acre). This is the stumpage value of the stand if the landowner were to choose to cut it all down today.

Kakogan Timber Revenues

Timber type	Stocking density	Acres represented	Clearcut value	Disc. Cash flow value	Per acre per year return
Maple	Well-stocked (BA>100)	29,500	$920	$207.32	$ 20.18
Maple	Moderate (BA=60)	18,665	$622	$71.09	$ 6.92
Aspen	Good	49,842	$500	$74.59	$ 7.26

Recognizing that we would not manage using clearcuts, we also estimated our per acre per year return based on the overall projected harvest during the 30-year analysis period and the current stumpage prices by species. We then projected these as regular cash flows over the 30 year period and applied a discount factor based on the estimated cost structure developed through our bank model. This gave us a net present value per acre for each timber type, presumably a value that we can afford to pay and succeed economically.

As with the preliminary analysis in Tug Hill, we understand that this is a very quick analysis with inherent flaws. First, no inflation or price appreciation are included, which would substantially decrease net present value calculations. Second, the artificiality of regular per acre per year yields may tend to increase the net present value. Third, there are no management or harvest costs associated with the clearcut value, which would tend to inflate it substantially.

However, it gives us a very simple way to highlight important issues. From this analysis, we note a few things that we then tested for specifically in our detailed business analysis:

- The land to target is clearly the well-stocked maple stands, but both aspen and moderately stocked maple stands are economically productive and may provide enough return to landowners to ensure deposits;
- The difference between a liquidation value (what the market may pay) and a net present value (what we can afford) is extremely high, which raises questions about our ability to successfully recruit depositors;
- FIA data that this is based on is from 1993, and harvesting has clearly proceeded at a rapid pace in the area, driven primarily by high prices for maple;
- Given our percentage reductions to meet conservation goals, we have less than our desired acreage for our best timber type and might have trouble getting to scale. Therefore, we will either have to accept a certain percentage of worse timberland or we will have to expand our target area for deposits.

Conclusions: Kakogan-Bad River Analysis

1. As with Tug Hill, the Kakogan-Bad River watershed starts with a mediocre forest resource, degraded in large part by poor past management and currently being harvested at unsustainable rates because of high maple prices.

2. The Forest Bank would clearly have to target high-value maple stands, but may not find sufficient acreage to reach our required scale of operation.
3. We may be able to enroll aspen lands on productive sites, particularly where harvest is less than 10-15 years off, and our goal would be to regenerate with northern hardwoods and a higher conifer content.
4. The management for Kakogan is clearly geared toward creating value on the stump. Sawtimber volumes at the end of the analysis period for both maple stands are more than double the initial volume even after multiple harvests. Our management over this period would open the option for valuable selective harvest systems in future and would dramatically improve the sawlog to pulpwood ratio.
5. We may have to create different deposit options that lower our cash outflow in the early years in exchange for greater remuneration to landowners as our cash flow improves.
6. Landowner response to the concept is surprisingly positive, and it seems as if there is a very receptive market for a Forest Bank in northern Wisconsin.
7. Reaching economies of scale will be difficult. The best way to move forward would be to identify a single, large depositor (>5,000 acres) or acquisition, which could form the "anchor tenant" in a Forest Bank strategy for the site.

Based on the feasibility analysis for Kakogan-Bad River, we feel this represents the best potential site for pilot testing The Forest Bank in the Great Lakes Basin. It is not, however, as good as a number of sites outside of the basin. In order to more fully determine whether it was a viable site, we completed a full business analysis and set of pro formas, which follow in the next section and Appendix D.

Conservation Recommendations: Kakogan-Bad River

These recommendations are ancillary to our feasibility analysis but are included in the hopes that they might inform future conservation efforts at this site.

- The Kakogan-Bad River watershed seems to fall into three different zones: 1) the upland watershed, dominated by maple forest and mixed hardwoods; 2) the clay plain, dominated by failing agriculture and aspen/poplar forests of varying quality; and 3) the reservation of the Bad River tribe and the sloughs that are the real conservation jewel of this area.
- Forest Bank protection as we have conceived it is only a valid conservation option for the upland watershed, but it could help protect large, important parts of the headwaters for these rivers if it were successful.
- Protection of the headwaters would also have to involve appropriate management by the Chequamegon National Forest, which seems likely at this point and is being pursued by the Conservancy as an ongoing goal.
- A critical aspect of success in protecting the sloughs will be the future disposition of the clay plain. Ideally, this should be allowed to revert to a mixed forest with a significant conifer component. Higher conifer components would reduce the "flashiness" of the river hydrology and decrease erosion at full-flow periods. Old field conversion to pure aspen/poplar and future industrial harvesting of same using current practices do not appear compatible with protecting water quality and hydrological regimes of these river systems.
- To be successful in this project, we believe the Conservancy—perhaps through a Forest Bank— or some other entity will have to create a reforestation program that can protect these mid-course parts of the stream from the effects of aspen dominated stands and current industrial harvesting practices.

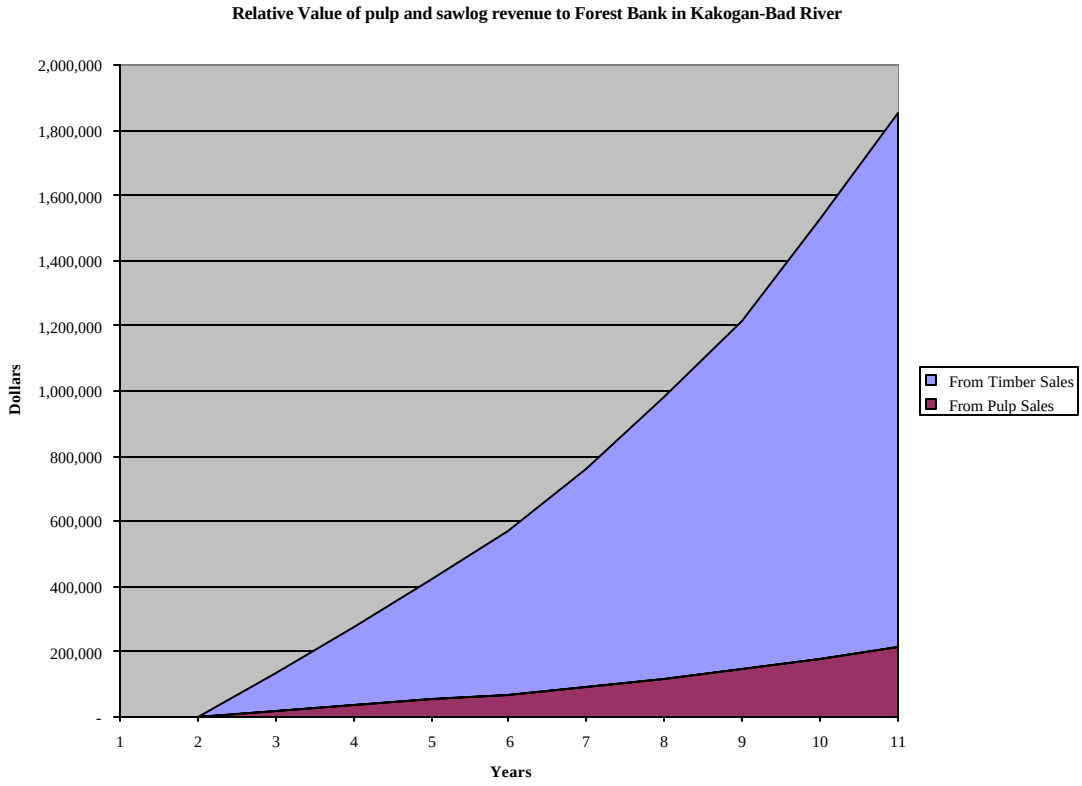
SUMMARY OF KAKOGAN BUSINESS ANALYSIS

Process

The Kakogan-Bad River Forest Bank pro formas were developed using the business model developed by CCED to analyze potential Forest Bank sites. It was first developed in cooperation with Mater Engineering for use in the Clinch. We subsequently engaged a team led by Hank Cauley, with Collins Pine/Kane Hardwood and Shorebank staff, to review and refine the model. We feel the result gives us a comprehensive analysis of a potential Forest Bank operation that is still simple enough to comprehend.

Our financial analysis for the Kakogan area shows that the woods of northern Wisconsin are a relatively poor resource that has been managed predominantly for pulp and paper. Sawtimber yields as low as 25% of total inventory are normal (as compared to yields of around 50% in the Clinch Valley Forest Bank and greater than 75% in Blue River, Indiana) and average stands are often understocked. Management projections by Steigerwaldt call for improvement cuts for 20-30 years, all the time accumulating significant value on the stump. This means that prospects for revenue from timber sales are significantly dampened over the 30 years of our timber analysis.

Site Comparison averages	Kakogan Wisconsin	Clinch Riv. Virginia	Blue River, Indiana
Initial sawtimber (bf)	7000	6600	4900
Average site index	65	72	84
Projected yield (BF per acre per year)	245	231	181
Growth rate (%)	3.5%	3.5%	3.7%
Sawtimber ratio	23%	50%	78%
Sawtimber yield (BF/acre/year)	56	116	141



Most important in the chart above is the comparable sawtimber yields per acre per year. In spite of the relatively high volumes in typical Wisconsin timberlands, only 23% will yield sawtimber, but sawtimber revenues account for 90% of the cash flow for The Forest Bank. The graph from the Kakogan-Bad River Forest Bank pro formas compares relative revenues from sawtimber and pulpwood under our most likely scenario.

Based on the initial characterization by Steigerwaldt of the model forest, we developed a set of assumptions for each timber type relating to starting volumes, growth projections, prices for sawtimber and pulp stumpage, appreciation rates, and sawtimber vs. pulp yield ratios. These were then plugged into our Forest Bank economic model, developed in part with support from this grant. Once we had included estimates of costs based on the Steigerwaldt and CCED surveys of the region, we could project financial performance of a Kakogan-Bad River Forest Bank.

Assumptions

The full pro formas are attached in Appendix D. Below are the key assumptions with the single "bottom lines" from the Profit & Loss, and Cash Flow statements at the top. The key assumptions which form this scenario are:

- The bank will offer a deposit value equal to about 60% of the clearcut value for any stand. We feel this is justified given that the market generally will not clearcut maple hardwoods in Wisconsin, but the value still may be low;
- 80% of our deposits are from well-stocked maple stands, 20% from moderately stocked maple, and none from aspen.
- The bank is able to create a below-market line-of credit which allows it to amortize the value of the timber deposits over 35 years;
- The bank will pay depositors a 3% dividend;
- The bank will raise a minimum of $3.5 million, a large proportion of which is a reserve against withdrawals. This will create an income stream in the meantime that earns at least 7%.

Selected highlights from Profit & Loss and Cash Flow statements										
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
EBITDA	(143,219)	(61,415)	(42,919)	19,264	86,421	131,067	236,911	350,826	503,083	670,338
Net Income	30,748	71,740	36,615	32,177	31,486	(17,640)	(17,416)	(9,845)	1,416	21,582
Net cash flow	3,522,155	77,298	44,672	36,334	43,043	(4,582)	(5,159)	(3,987)	12,173	33,839
Closing cash	3,522,155	3,599,453	3,644,125	3,680,459	3,723,503	3,718,921	3,713,762	3,709,775	3,721,948	3,755,788

Assumptions

Class	**Vol/Acre (BF)**	**Harvest/Ac (BF) Shelterwood**	**Harvest/Ac (BF) Selection**	**Mix in Bank**	**Sawlog Price/MBF**	**Sawlog Price Appreciation**	**Pulp Price/MBF**	**Pulp Price Appreciation**	**Forest Growth Rate**	**Percent Sawlo**
Class 1: Maple High	11000	8500	3500	80%	230	2.0%	35	0.5%	3.7%	25%
Class 2: Maple Low	8500	6000	2500	20%	210	2.0%	35	0.5%	3.2%	25%
Class 3: Aspen	9000	9000	3000	0%	140	2.0%	35	0.5%	6.0%	10%
				100%						

Bank Deposits	**Year 1 (acres**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
	2500	2500	5000	5000	5000	7500	7500	7500	10000	10000

Percent of Growth Harvested	(In other words – if growrth at 3% and percent of growth at 200% - 6% of volume is harvested.)									
Class 1	0%	100%	100%	100%	100%	95%	95%	95%	95%	95%
Class 2	0%	100%	100%	100%	100%	95%	95%	95%	95%	95%
Class 3	0%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Shelterwood/Selection Mix (Percent Shelterwood shown here)										
Class 1	0%									
Class 2	0%									
Class 3	100%									

Assessment Value/Acre			value of inventory	percent discount for sustainable management						
Class 1	$ 520.00		921	44%						
Class 2	$ 380.00		669	43%						
Class 3	$ 235.00		410	43%						

General Conclusions

We believe that the assumptions which form this proforma are moderately to very conservative. They allow limited real price appreciation for sawtimber—well below what the Steigerwaldt trends analysis would indicate. They forecast timber growth at the low end of our range. They expect virtually no price appreciation for pulpwood over the ten years. And the initial volumes are also on the low end of those provided by Steigerwaldt.

On the other hand, our assumptions about the types of deposits we take is aggressive. It assumes that we will be able to attract nearly 50,000 acres of well-stocked maple forest as deposits and that we will take no aspen forest at all because sensitivity analysis on this variable showed us that the bank was not viable with any significant level of aspen deposits. Meeting this aggressive target for deposits would be very difficult if we only target NIPF owners with average parcel sizes of 80 to 100 acres.

Our ten year target is for 62,500 acres of timber deposits with a total value of about $30 million. This would include a two-year "proof of concept" phase in Kakogan in which our benchmarks are 5,000 acres deposited, $3.5 million in initial capital, and deposit profiles that match or exceed our assumptions (80% or more in well-stocked hardwood stands). At the end of ten years, the cost for protection of 62,500 acres based on initial capitalization requirements would be around $60 per acre, which is the kind of significant conservation leverage The Forest Bank is intended to create.

Based on the above assumptions, the Earnings Before Income Tax Depreciation and Amortization (EBITDA) are positive in year 4 which is good and EBITDA/revenues (see Appendix B) are generally in line with industry norms. The net income and net cash flow over the ten year period are buoyed by the very high initial reserve levels, which throw off income to the bank. Without an initial cash investment of $3.5 million supporting operations and subsidizing the payments to landowners, however, the bank is not viable.

One of the key issues for these business projections is the disposition of the liability for timber deposits acquired. Our assumption is that the Conservancy will create a fund to acquire timber rights from The Forest Bank when a landowner cashes out. The timber rights themselves are then owned by TNC, who has the right to the future dividends. We built our business model this way because we felt that without a track record it was impossible to project likely withdrawal patterns and rates and model them for a business analysis.

In order to build this structure, however, the Conservancy must have access to cash or a line of credit up to the level of reserves that we establish for the Bank. Prudence would dictate that in the pilot efforts, the reserve value should be 100%, though we may be able to hedge that level with alternative deposit options that ensure long-term deposits. To pay off the principal, the Forest Bank has amortized the debt over 35 years beginning with the initial deposit. This means around 3% of the value of the timber is transferred each year into the reserve fund which is used to pay out landowners, decreasing over time the cash or credit requirement for the Conservancy. However, it takes 35 years from the time of deposit to fully pay off that liability, which makes it a very long-term debt.

The second issue raised by this need for liquidity is that the proforma indicates a viable (if breakeven) operation only as long as the interest on the cash we draw from the Conservancy's reserve fund is around the same as the dividend rate we are paying landowners. Essentially we can afford to pay interest of somewhere between 4% and 5% on any debt we incur to provide liquidity to landowners. This means we will have to find a source of below-market credit to create our liquidity (at least $28 million by year 10), either from the Conservancy or from outside sources such as tax-exempt bond issues or philanthropic PRIs. Without it, we don't believe this bank is viable.

Given these assumptions, a Forest Bank is possible for the Kakogan-Bad River area, but there are some clear cautions.

- The bank must target the well-stocked hardwood stands with an average of 22 cords per acre and at least 25% in sawtimber. Given that the acreage of this particular forest type is limited, we may have to look outside the immediate watershed early;
- Given the poor projected cash flow in the early years, we should create and test a different option for depositors that either limits early dividends, delays the ability to withdraw principal early, or both;
- After an initial "proof of concept" phase over two years, we will have to rapidly increase deposits to achieve our targets of 62,500 acres by year 10. It makes sense to identify key "anchor tenant" depositors, large landowners who could rapidly increase the acreage under Forest Bank management.
- We clearly cannot pursue deposits of aspen unless they are nearly ready for harvest or we have developed alternative deposit options that decrease negative cash flows prior to harvest;
- The $3.5 million in capital supports operations and secures us against the potential withdrawal of roughly 5,000 to 6,000 acres. The full projected deposit value at the end of 10 years under this scenario is roughly $30 million.
- Additional investments will have to be secured after the "proof of concept" phase is accomplished to maintain a safe level of cash reserves, but at this point it is very difficult to determine what a safe level would be;
- Since it is so important to our conservation goals to work on the clay plain at Kakogan, we have to create a new set of offers to enroll poorer quality timberlands. In particular, ecological success in the Kakogan watershed will require us to fund "reforestation" work.

Assuming our ability to carry out the management regimes suggested by Steigerwaldt, we know the forests of the Kakogan-Bad River uplands can be extremely productive and profitable in time. They will produce very high value sawtimber and veneer quality maple, and they can be managed sustainably using selective harvest systems. The key is to figure out how to manage cash flow successfully in the interim. Among the options are:

1. Offer low initial valuations to landowners but re-appraise the timber every ten years, offering the landowner a significant portion of the upside;
2. Lower or eliminate dividends to the minimum acceptable, at least until the forests are producing significant revenue;
3. Significantly restrict the cash-out options for landowners, particularly if their forests will not be harvested for 10 or more years.

If we can figure out how to survive the lean years that we expect, there is every reason to expect success at the Kakogan site. However, twenty to thirty years is a very long time horizon for a business, and it will require extremely patient capital and management. The Nature Conservancy is in a unique position to implement such a business, since our time horizon for mission success looks out 50 to 100 years. The key will be to attract capital that is as patient. With the right investors and management, Kakogan-Bad River is the best place to pilot test a Forest Bank in the Great Lakes basin and may be a good place to pilot the idea nationally.

Next Steps for Kakogan-Bad River Forest Bank

The key issues left to resolve before deciding to implement a Forest Bank pilot project at Kakogan are:

1. **Can we raise the necessary investment:** The minimum investment required for this Bank is $3.5 million. This would allow us to complete a "proof of concept" phase to enroll around 5,000 acres. The $3.5 million would support operations and create a reserve against withdrawals to buffer the Conservancy's exposure.
2. **Can we identify 2-3 key "anchor tenant" depositors or acquisitions of 5,000+ acres to get us to scale quickly:** We are currently exploring with a couple of key landowners their willingness to participate. This could involve an acquisition by TNC, who would then become a depositor itself in The Forest Bank. We would like to see 8,000 to 10,000 acres in anchor tenant deposits lined up before we move forward.

If the proof of concept phase were successful we would have one additional step prior to our being able to build the bank to scale. This issue is not particular to one site, but will also be a critical issue in getting to scale nationally. We will have to have access to a line of credit that would provide necessary liquidity at scale. Cash reserves will have to be augmented as deposits grow, and we will have to create a financing mechanism that provides sufficient liquidity, is affordable within our projected cost structure, and does not threaten the financial health of The Nature Conservancy.

CORE BUSINESS STRUCTURE AND OPERATIONS OF THE FOREST BANK

The work done through this grant from GLNPO has enabled us to think strategically about how we get the Forest Bank to scale nationally. Because we've advanced our methodology, we've also informed our goals for long-term implementation. Assessing the sites in the Great Lakes raised a number of different issues about how a Forest Bank could achieve financial viability and support the biodiversity mission of the Conservancy. These issues have helped developed four different operations that will allow us to achieve success and grow the bank to a national scale.

1. **Small Landowner Deposits**—aggressively secure timber rights from NIPF owners and manage collectively to achieve economies of scale and a fair return for landowners. Our target is to have 3-4 pilot sites in the next year with expansion at those sites after 2-3 years of successful operation.

2. **"Anchor Tenant" Acquisitions**—identify larger acquisitions, either through creative deposit options with large landholders or through direct purchase of fee simple rights. These acquisitions would serve to anchor our work at existing sites and spread our fixed costs over a large area quickly, thereby allowing us to grow the small landowner side of the business. This business line will quite likely require innovative financing mechanisms involving the private capital markets. If we can develop financing mechanisms, we may also offer acquisition financing for working forests to TNC chapters as "stand-alone" Forest Bank sites.

3. **Reforestation Program**—identify funding sources (ie. carbon sequestration markets) and create a program to enroll low-value timberland or non-forested lands and plant with trees. This is particularly important in mixed-agriculture areas where aquatic diversity is a conservation goal. For us to meet conservation goals in the Kakogan project area, this would be a critical part of the overall plan. We see this as a small part of the overall operation and dependent on philanthropic or government funding.

4. **Targeted product marketing**—use the TNC brand and core constituency of over one million members to market products using sustainably produced timber, particularly focusing on creating markets and/or adding value to secondary species and lower grade material from our Bank operations.

It is clear from the work we did as part of this grant and elsewhere that within the pilot projects, we must prove the concept at a small handful of sites in our first 2-3 years. We will benchmark this "proof of concept" based on three items: 1) number of landowners signed up and total acres enrolled; 2) ability to raise target capital; and 3) ability to solve the liquidity issues sufficiently to grow the banks to scale following the pilot phase.

Within a site, the business model that has developed for The Forest Bank out of our feasibility work is the concept of a "mall." To be successful, we have to enroll key "anchor tenants," or large landowners, who can get us to scale quickly and who serve as opinion leaders and persuasive voices in their communities. At the same time, we have to fill the smaller retail spaces with NIPF owners in sufficient quantities to achieve critical mass.

We believe that if the pilot projects are successful, we are able to meet our economic and conservation objectives, we can raise the capital to expand, and we can create sufficient liquidity, we can build The Forest Bank concept into a national program that could protect hundreds of thousands of acres of working forest nationally and could significantly advance the Conservancy's ability to protect intact, functioning landscapes.

OTHER WORKPLAN ITEMS: ANALYSIS OF BENEFITS FOR FOREST CERTIFICATION

As part of this work CCED has explored in detail the benefits of certification at a wide range of sites, within the basin and elsewhere. It is our intention to seek certification, most likely through an FSC affiliated certifier, once we have begun operations in any given site. The following bullets summarize our analysis.

Benefits of FSC Certification

- Potential access to new/niche markets for products now and in future, particularly overseas.
- An added marketing tool to convince potential depositors that our management will meet the promise of sustainability.
- FSC is probably compatible with other certification schemes in case we choose to pursue other options in future or if FSC does not succeed.

Drawbacks/Costs of FSC Certification

- Lack of reliable price premiums and significant added costs, particularly in early years of the bank when fixed costs are spread across smaller acreage.
- Question of whether FSC will emerge as a brand with value or will be overtaken by other certification standards.
- Intuitive belief that for timber marketing purposes, a TNC brand or logo may have at least as much value in the foreseeable future as an FSC logo.

BUDGET RESOLUTION

The project budget and resolution is on the following page. We raised $503,600 in support of this work. Donors included:

George Gund Foundation	$100,000
Great Lakes National Program Office, EPA	**$150,000**
Norcross Foundation	$ 3,600
Moriah Fund	$ 7,000
Great Lakes Protection Fund	$250,000
Total Raised	$510,600
Non-federal portion	$360,600

Because of our tracking requirements for federal funds, the EPA grant was separated from the private philanthropic grants throughout the process. The accounting that follows describes only the federal portion of our project and the match for that, a total of $158,000.

FINANCIAL REPORT

Environmental Protection Agency--GLNPO
Grant: GL 5905-01
total project

	Budget (Revised 12/19/99)	Actual Expenses FY1999	Actual Expenses FY2000	Total Actual Expenses
Total Budget				
Personnel	32,618	18,454	25,683	44,137
Fringe Benefits	11,182	6,934	9,631	16,565
Contract Costs	89,050	71,525	13,043	84,568
Postage	150	147	-	147
Total Direct Expenses	133,000	97,060	48,357	145,417
Indirect Costs	25,000	18,830	9,381	25,000
TOTAL:	$ 158,000	$ 115,890	$ 57,738	$ 170,417
Federal Share	$ 150,000			$ 150,000
TNC Match	$ 8,000			$ 8,000
NET:	$ -			$ 12,417

APPENDIX A

DESCRIPTION OF TIER ONE AND TWO SITES IN THE GREAT LAKES BASIN

First Tier Sites:

Kakogan Sloughs-Bad River, Wisconsin

The 16,000 acre wetland that forms the Kakogan Sloughs near Ashland is the largest and healthiest estuarine system remaining in the upper Great Lakes region and is a National Natural Landmark and a TNC bioreserve project. Called Wisconsin's Everglades, it is served by one large and two small watersheds with a total size of 677,902 acres, much of it forested. This watershed provides habitat for eagles, lake sturgeon, black terns and recently the once extirpated trumpeter swan, in addition to 72 rare species of plants and animals.

The diversity and health of this world-class resource ultimately depends on the quality and quantity of waters entering the sloughs from their vast watershed. Situated at the juncture of three natural divisions, the Kakagon/Bad River (KBR) watershed contains 28 natural communities representative of the region. Shaped by the interaction of geology, hydrology, soils, climate, species adaptation, and human history, these natural communities form a distinct mosaic over the landscape.

There are a number of stresses that threaten the natural elements and ecosystem processes of this system. One threat, unsustainable forest management and incompatible harvest regimes in the uplands, carries with it the potential for long-term, serious impacts to the sloughs system. Research shows that clearcuts in upland hardwood or conifer systems increase annual stream flow by 30% to 80%, while return to preharvest flows require from 12 to 15 years. Annual peak flows are at least doubled, and snowmelt peak increases may persist for 15 years. Aside from the direct ecological impacts of habitat conversion and forest fragmentation, the resulting increased flows and sedimentation may negatively affect river habitats and the sloughs complex. Channel widening as a result of more frequent and higher flood flows may result in a net loss of riparian communities, and increased sediment deposition may cover gravel spawning beds of federally threatened lake sturgeon.

The sloughs complex itself is primarily owned by the Bad River Band of Lake Superior Tribe of Chippewa Indians with scattered inholdings owned by private individuals and corporations. Outside of the sloughs, roughly 65% of the land within the watershed is publicly owned by either the Chequamegon National Forest, state, and county entities. The remaining 35% is held in private ownership. This represents just over 240,000 acres in total, of which roughly 90,000 acres is non-industrial. The Conservancy is already working with the public agencies to incorporate water quality and biodiversity conservation goals into the management plans governing these lands. The Forest Bank is seen as potentially the best tool for protecting the private forestland within this watershed.

Western Upper Peninsula Forest Improvement District (WUPFID), Michigan

WUPFID may be the only operating forest cooperative in the nation. Serving five Upper Peninsula counties, it provides forest management and marketing services to over 1000 members, representing around 167,000 acres of private, non-industrial forest. The cooperative was originally organized as a quasi-public entity to address the need for timber-based job creation in the region. Since the early nineties when the state of Michigan cut financial support, it has operated as a financially self-standing institution.

CCED began talks with WUPFID in early 1998 to discuss a potential joint venture that would bring the Forest Bank as a service to the WUPFID membership. In May 1998, the board of WUPFID formally requested that CCED complete a market analysis of its membership to test whether the Forest Bank idea held appeal and to what extent.

The western Upper Peninsula presents some unique challenges and opportunities for CCED. Most importantly, it is a site—particularly the Keweenaw Peninsula—that has been identified as important biologically. Yet it is also a site that has no on-the-ground presence by the Conservancy. One of our hypothesis is that the success of the Forest Bank concept may depend in large part on the credibility that the Conservancy has built in various sites by a physical staff presence over time. In part, the WUPFID project allows us to test that hypothesis and to look for ways to use the Forest Bank in sites that are ecologically important but to which the Conservancy has no strong connection. We are attempting to leverage conservation beyond the strict boundaries of sites where TNC is already active. Success outside of sites where TNC is active is important if we are to make this a truly national tool for forest conservation.

That said, our likely best approach is to consider the western UP and northern Wisconsin as one project site. Our strategy, therefore, would be to establish a viable bank first in Kakogan Sloughs and, if it is successful, create a joint venture with WUPFID to offer The Forest Bank as an alternative to their established membership. Such a joint venture would likely involve a contractual relationship with WUPFID as the forest manager for us.

Tug Hill, NY

Tug Hill encompasses 2,100 square miles bounded by the Adirondack Mountains to the east, Lake Ontario to the west, Oneida Lake to south, and the Black River to the north. From west to east, the region rises gently from the Great Lakes floodplain to a height of 2,100 feet above sea level before dropping off in a series of escarpments to the Black River. The region is mostly forested at the core with increasingly fragmented timberland beyond that. Northern hardwoods dominating the landscape.

The region's size, remoteness and environmental quality make it one of New York's most important and special areas. Regionally, it is also one of the most important, intact, mesic beech-maple forest communities in the Northeast. According to a Conservancy scientific review, protecting the biodiversity values of the forest requires protecting large blocks (25,000 acres minimum) of the unfragmented forest matrix. Forestry and silviculture, done correctly, could be compatible with the goals of protecting Tug Hill's biodiversity values.

Historically, the key to Tug Hill community's vitality has been that many of its people make a living from the land, whether they are employed by a forest-based industry, tourism agency, or recreation organization. This is no different today. Private land ownership and stewardship over the years has been key to keeping intact those natural resource qualities most important to Tug Hill communities. Retaining this active stewardship of private lands is essential to retaining the area's abundant natural resource base in the future.

With second home development and increased subdivision creeping toward Tug Hill's core, greater numbers of landowners with little experience in land management are finding Tug Hill appealing because of its offerings of solitude and a rural lifestyle. However, collectively these landowners have the potential to change the face of Tug Hill by fragmenting its intact forest lands. This fragmentation can lead to degradation of water quality, loss of wildlife habitat and biodiversity, and loss of access for traditional hunting, fishing and recreation activities as well as a downturn in community economic vitality.

The Tug Hill region is defined in state law to include 41 towns and 21 villages, located in 4 counties. Most residents, however, would define Tug Hill to be the nearly roadless, forested core area of the region, about 200,000 acres in size. The western half of the core forest holds the Salmon River and Mad River watersheds which supply the lower Salmon River, a premiere fishing and recreational resource of national importance. The eastern half of the core forest holds the headwaters of the East Branch of Fish Creek, drinking water supply for the City of Rome. Ownership of these lands is a mix of large, private industries, long-standing family ownerships and state-owned properties. Roughly 54,000 acres of the core forest are in the hands of non-industrial private forest owners.

Second-Tier Sites

Land-o-Lakes, WI

The privately-owned forest on the Michigan-Wisconsin border is surrounded by state and federal forests and is dominated by some very large ownerships, primarily in hunt clubs. This is likely to be as good an area for a Forest Bank as Kakogan-Bad River, and we see Land-o-Lakes area as a natural extension of the Kakogan bank. Relatively short freight distances would probably allow us to create centralized operations in Mellen that could handle wood sorting and storage for any properties we acquire in Land-o-Lakes. In addition, the Land-o-Lakes area would provide us with important additional acreage that will help us create economies of scale by spreading our fixed costs over a broader resource base in a shorter period of time. In terms of strategic approach, we see establishing a viable "proof of concept" phase in the Kakogan area, then targeting some of the largest hunt clubs in Land-o-Lakes to create a few "anchor" properties that get us to a large scale quickly.

Lake George/Lake Champlain valleys, NY

The Lake George/Lake Champlain valleys present a potential forest bank site that is worth pursuing in future. For the purposes of this effort and because of a major change in staff within the Adirondacks office of TNC, we decided to postpone in-depth analysis of this site. However, we feel this site has very high potential for success in future.

The Lake George landscape lies on the southeast edge of the Adirondacks, and part of the lake basin is within the park boundary, meaning that any state land is declared forever wild. At the north end of the lake is the original mill for International Paper. At the south end is the Dixon-Ticonderoga mill, giving the site two major markets for pulp wood in the immediate area. Both of these industrial operations remain concerned that as conservation interests continue to protect the fragile resources of the lakes' watersheds, the state continues to acquire additional land within the park boundary, and ownerships are increasingly subdivided below a workable size, they are losing their resource base.

Traditional Conservancy work in Lake George has been remarkably successful in protecting miles of shoreline parcels, but these projects generally become cooperative transfers to the state, which means the land leaves forest production. Although it is the right thing to do for conservation, it does not garner much support from the population that makes a living from the timber resources.

The Conservancy sees the Forest Bank as a key opportunity to compromise in this situation; to protect a much broader area of the watershed than would be otherwise possible, but to do it in a way that also allows the continued use of the resource. Once we have successfully piloted other sites within the basin or outside it, we see Lake George/Lake Champlain as very high potential sites for Forest Bank involvement. It handily exceeds all of our prerequisites for a good potential site.

Eastern Upper Peninsula, MI

This site encompasses the three eastern-most counties of the U.P. and includes two current TNC project areas, the Northern Lake Huron project and the Two-Hearted River. The site includes some of the highest quality northern hardwoods in the U.S. (the most recent summer Olympics featured a basketball floor that was made with maple from this area), and the forest forms a critical corridor along the Niagara Escarpment from Canada to the large blocks of public land in the Hiawatha National Forest and the Lake Superior State Forest.

In our discussions with Conservancy staff working in the area, it seemed that local support for a Forest Bank at this point may not be very strong. We agreed with Michigan TNC staff that it made sense to try the project elsewhere first, and allow the community strategic planning processes in which the Conservancy is engaged build stronger support for something like a Forest Bank.

Oak-Pine Complex, Northern Lower Peninsula, MI

The central highlands of the northern lower peninsula contain a complex of moraine ridges, which are dominated by oak and pine, and outwash plains, which are dominated by jack pine. The jack pine is largely in public ownership and provides habitat for kirtland's warbler and other species. The moraines are largely in private ownership. These areas also drain some very important Great Lakes tributaries, like the Pigeon, Au Sable, and Sturgeon rivers. As the moraine forests face increasing subdivision and population growth, they pose a threat to biodiversity conservation in that the use of controlled burning will be increasingly restricted on the outwash plains. A forest bank might help to hold together significant acreages as permanent forest, which could simplify continued fire management in the jack pine.

The private land has a large number of very big ownerships, on the order of 10,000-20,000 acres each, many of which are hunt clubs. If we choose in future to pursue this area, it would likely be dependent on an expression of interest from at least one of these owners, thereby giving us an "anchor" depositor.

Huron Mountains, MI

The large ownership represented by the Huron Mountain Club could be one of the most natural and successful Forest Banks in the basin. With a single owner of over 18,000 acres of high quality timber in a pristine or semi-pristine state, we viewed this site as a great opportunity. The club was considering beginning timber harvest to help cover taxes and maintenance costs, and we approached them with the Forest Bank idea. The Club property has been a de facto forest reserve for many years. Clearly the best option for conservation is to leave the land as is.

After multiple conversations with members of the club, the conservation committee of the Huron Mountain Club chose not to do any timber harvest on its land except as it reduces a fire hazard around inhabited areas. It was apparent to us that without this key anchor property, the surrounding mix of industry, public, and limited private land could not support a Forest Bank. This site is only worth revisiting if the Huron Mountain Club decides at some point in the future to change its forest management policy.

Hemlock/Canadice/Honeoye Lakes, NY

The western Finger Lakes in New York contain some high quality oak/maple sites and protect drinking water supplies for the city of Rochester. We met with the city water supply officials, which own and manage 7,000 acres around Hemlock Lake, and with area foresters to assess at a preliminary stage this site for its potential. The site is particularly interesting because it falls within a different climactic zone from all of our other sites in the basin. This is the only one dominated by oak, and it has significantly higher growth potential than our more northerly sites. However, the site has a number of drawbacks.

Most importantly, the area has been very heavily high-graded and the access to good quality timber is not very good. As an example, of the 7,000 acres owned by the City of Rochester, we judged that only 1,000 were suitable for Forest Bank. Other timber holdings are scattered over a very wide area and are in relatively small parcel sizes. A majority of the "forest land" is abandoned farmland with unacceptable growing stock. Although there may be enough total, private land the quality of the potential deposits was quite poor. This site would probably have to encompass a much larger part of the Finger Lakes region and/or southern tier of New York, which takes it largely out of the Great Lakes watershed.

APPENDIX B

Forest Bank Market Analysis
Kakagon Sloughs

Introduction

In the summer of 1999 staff from the Chequamegon Bay Watershed Project began contacting landowners in Grand View and White River areas in the Southwest portion of the Bad River watershed, Bayfield County, Wisconsin, to begin to determine the level of interest a random sample of landowners would have in the Forest Bank concept. Landowners with forested land were contacted from a list generated by Steigerwaldt Land Services, Inc. (SLS) based on aerial interpretation of the type and condition of the timber on their land. It was felt that to fully evaluate their interest in the Forest Bank, landowners would need to be fully informed regarding the financial value of their standing timber. A timber resource assessment, to determine the standing timber value, was conducted on the forests of landowners that expressed a high level of interest in the Forest Bank.

Initial land owner contacts

Landowners were contacted by one or more of the following methods: door-to-door visit, letter and phone call. Sixty three landowners, owning 77 tracts, totaling over 5,000 acres of land were identified from SLS's aerial photo interpretation. Five additional landowner not on SLS's list were also contacted. Of these 68 landowners, 42 (62%) could not be contacted within our time period, 21 (31%) liked the Forest Bank concept and 5 (7%) were not interested. Of the 26 contacted, 18 (69%) were willing to allow us to conduct a forest resource assessment of their property, 3 (11.5%) were interested but had recently sold or harvested their timber, and 5 (19%) were not interested.

Eight landowners were contacted by driving to their house and knocking on their door. Of the 8, 5 landowners were interested in the Forest Bank, however one had recently sold their timber, and 3 were not interested. Of the 3 not interested, one was a logger, another recently had their land logged and was happy with the job done, and the third was truly not interested.

Fifty four landowners were sent letters followed by a phone call, when a phone number was available. Of those receiving a letter and call the results are as follows:

9 Responded very favorably to the Forest Bank concept and agreed to allow us to do a forest resource assessment
2 Not interested
1 Sold Land
1 Currently having land cut

1 Logger; no reply
1 Spoke to son, didn't talk with owner
1 Spoke to spouse- said they would discuss with each other- no reply
35 Could not contact – 15 unlisted phone; 20 left message no reply
3 Known to be loggers were not contacted
3 Were a mortgage, development or investment company – no reply

Forest resource assessment landowner interviews

Five landowners, not identified by SLS, and 12 that were identified expressed interest in the Forest Bank concept and agreed to allow us to do a forest resource assessment on their property. After the assessments were completed, we were unable to re-contact one of the landowners. Ten of the 17 (59%) landowners when asked the question if they would enroll their timber in the Forest Bank said yes. Three (18%) landowners said that the Forest Bank would not be for them and 4 (23%) said they liked the idea, however would need to think more seriously about the Bank before saying yes. The group of 4 undecided all were concerned with their potential loss to use the property for recreational proposes such as collecting maple syrup, skiing or creating an ATV trail. This group all had young children and were concerned about limiting their children's future use of the land. For more results see Table 1.

Interviewing Landowners

Following the forest resource assessments the 17 participating landowners were recontacted and interviewed at a face-to-face meeting. During these interviews each owner was given information regarding their particular tract of forest, asked a series of questions, and was given information explaining the Forest Bank concept in further detail. The questions presented to the landowners are seen below:

1) How did you come to own your land? How long?

2) Do you ever get out and walk your land?

3) What are your long-term plans for your land?

4) If you sold your land or passed it on to your heirs, would you hope that it remain wooded and well treated, or does that not matter to you?

5) Have you ever sold timber from your land? (If Yes) How recently? Were you happy with the harvesting and price received?

6) What do you think your timber is worth?

7) What do you like about the Forest Bank concept? (Annual income, Honest valuing of timber, High standards of forest management, Access to the deposit, Protection against catastrophic loss, Long-term protection of forest)

8) What would concern you about the Forest Bank?

9) Do you think you would be interested in putting your timber in the Forest Bank?

10) May we contact you again if we decide to open a branch of the Forest Bank in the Chequamegon Bay region?

Table 1. Results of interviews with landowners after having conducted the forest resource assessment.

Predominate Characteristics of Landowners	Interested N=10	Not Interested N=3	Undecided N=4
Age	20's to 70's	40's to 60's	40's and 50's
Average Acreage	113.56	66.67	110.00
Average Timber value	$51,448.83	$20,417.67	$47,242.88
Ave. Value/Acre	$707.10	$471.04	$501.85
Purchased Land	100%	100%	100%
Interaction with forest	Much	Moderate	Moderate
Goals for forest	Conservation; Sustainable harvest	Forestry; Sell	Recreation; Leave land to children
Want long-term protection	Yes	Not of high importance	Yes
Sold timber before	80% Yes	100% Yes	25% Yes
Timber value estimate	8 below; 1 no idea; 1 at appraisal	1 above; 2 below	2 above; 2 below
Benefits liked	High Standards of forest management	Access to timber value	High Standards of forest Management
Concerns	Loss of their ability to control forest management	Loss of control	Loss of some recreational potential; concerns of restricting future generations use
Can we re-contact	Yes	Yes	Yes

Sample size = 17

APPENDIX C

SELECTED PRO FORMA STATEMENTS FOR THE KAKAGON-BAD RIVER WATERSHED

Profit and Loss Statement: Pro forma

Kakogan-Bad River Forest Bank
Pro Forma Projections: Profit and Loss Statement
Scenario: 62,500 acres by Year 10

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
acres in	2,500	5,000	10,000	15,000	20,000	27,500	35,000	42,500	52,500	62,500
Revenues										
From Timber Sales	-	119,925	242,306	369,372	501,260	666,763	865,797	1,072,632	1,351,771	1,641,793
From Pulp Sales	-	17,629	35,094	52,711	70,480	92,372	118,182	144,262	179,131	214,364
Appaisal Fees	-	-	-	-	-	-	-	-	-	-
Net Sales	**-**	**137,554**	**277,400**	**422,083**	**571,740**	**759,136**	**983,980**	**1,216,894**	**1,530,901**	**1,856,156**
Forestry Related Operating Expenses										
Bank Manager salary + benefits	62,500	62,500	62,500	62,500	62,500	62,500	62,500	62,500	62,500	62,500
Assistant Forester salary + benefits	-	-	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000
Staff Incentives	1,875	1,875	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225
Conflict resolution (reserve)	1,250	2,500	5,000	7,500	10,000	10,000	10,000	10,000	10,000	10,000
Consultant foresters	10,000	15,000	7,500	7,500	7,500	11,250	11,250	11,250	15,000	15,000
Pesticides and Herbicides	-					-				
Forestry supplies	-	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000
Payments to landowners	39,000	78,000	156,000	234,000	312,000	429,000	546,000	663,000	819,000	975,000
Gross Profit on Forestry Operations	(114,625)	(24,321)	(4,325)	59,358	128,015	194,161	301,505	416,919	570,676	739,431
Other Operating Expenses (inc:)										
Timber sales and marketing (bids)	-	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
Deposit sales and marketing	4,000	6,000	7,000	8,000	9,000	10,000	11,000	12,000	13,000	14,000
Vehicle lease payments	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
Vehicle fuel and maintenance	4,594	4,594	4,594	4,594	4,594	4,594	4,594	4,594	4,594	4,594
Other operating expenses	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500
Operating Profit	(130,219)	(48,415)	(29,919)	32,264	99,421	164,067	269,911	383,826	536,083	703,338
Administrative Expenses (inc:)										
Administrative Assistant	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000
Communications	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
Rent and utilities	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000
Legal services	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Accounting services	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Audits	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Insurance	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000
TNC O/H Contributions	(40,000)	(40,000)	(40,000)	(40,000)	(40,000)	(20,000)	(20,000)	(20,000)	(20,000)	(20,000)
EBITDA	(143,219)	(61,415)	(42,919)	19,264	86,421	131,067	236,911	350,826	503,083	670,338
Equipment Depreciation	3,058	3,058	3,058	3,058	3,058	3,058	2,258	2,258	2,258	2,258
Timber depletion	-	-	-	-	-	-	-	-	-	-
Payments to Withdrawal										
Reserve Fund	41,000	70,286	140,571	210,857	281,143	386,571	492,000	597,429	738,000	878,571
Interest earnings (on idle funds)	231,202	237,244	238,855	240,617	242,759	240,922	239,931	239,016	239,198	241,323
Pre-Tax Profit	43,925	102,486	52,307	45,967	44,980	(17,640)	(17,416)	(9,845)	2,023	30,831
Taxes	13,178	30,746	15,692	13,790	13,494	-	-	-	607	9,249
NET INCOME	30,748	71,740	36,615	32,177	31,486	(17,640)	(17,416)	(9,845)	1,416	21,582

Cash Flow Statement

Cash Flow from Operations	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Net Income (+/-)	30,748	71,740	36,615	32,177	31,486	(17,640)	(17,416)	(9,845)	1,416	21,582
Subtract changes in A/R	0	0	0	0	0	0	0	0	0	0
Subtract changes in inventory	0	0	0	0	0	0	0	0	0	0
Add back changes in A/P	0	0	0	0	0	0	0	0	0	0
Add back depreciation	3,058	3,058	3,058	3,058	3,058	3,058	2,258	2,258	2,258	2,258
Add back depletion	-	-	-	-	-	-	-	-	-	-
Add back reserves	1,250	2,500	5,000	7,500	10,000	10,000	10,000	10,000	10,000	10,000
Sub-Total: Operations	35,055	77,298	44,672	42,734	44,543	(4,582)	(5,159)	2,413	13,673	33,839
Cash Flow from Investments										
Cash from sale of securities	0	0	0	0	0	0	0	0	0	0
Purchase of equipment	12900	0	0	6400	1500	0	0	6400	1500	0
Purchase of securities	0	0	0	0	0	0	0	0	0	0
Sub-Total: Investments	(12900)	0	0	(6400)	(1500)	0	0	(6400)	(1500)	0
Cash Flow from Financing										
Equity Investment	3,500,000	-	-	-	-	-	-	-	-	-
Cash from bank borrowings	0	0	0	0	0	0	0	0	0	0
Cash Rec'd from Amortization Account	-	13,000	26,000	52,000	78,000	104,000	143,000	182,000	221,000	273,000
Principal payments to depositors	-	13,000	26,000	52,000	78,000	104,000	143,000	182,000	221,000	273,000
Sub-Total: Investments	3,500,000	-	-	-	-	-	-	-	-	-
NET CASH FLOW	**3,522,155**	**77,298**	**44,672**	**36,334**	**43,043**	**(4,582)**	**(5,159)**	**(3,987)**	**12,173**	**33,839**
Opening Cash Balance	0	3,522,155	3,599,453	3,644,125	3,680,459	3,723,503	3,718,921	3,713,762	3,709,775	3,721,948
Closing Cash Balance	3,522,155	3,599,453	3,644,125	3,680,459	3,723,503	3,718,921	3,713,762	3,709,775	3,721,948	3,755,788

Balance Sheet Statement

	Year-End 1	**YE-2**	**YE-3**	**YE-4**	**YE-5**	**YE-6**	**YE-7**	**YE-8**	**YE-9**	**YE-10**
Assets										
Cash and Equivalents	3,522,155	3,599,453	3,644,125	3,680,459	3,723,503	3,718,921	3,713,762	3,709,775	3,721,948	3,755,788
A/R	0	0	0	0	0	0	0	0	0	0
Short-term Investments	0	0	0	0	0	0	0	0	0	0
Prepaid Items	-	-	-	-	-	-	-	-	-	-
Inventory	0	0	0	0	0	0	0	0	0	0
Total Current Assets	***3,522,155***	***3,599,453***	***3,644,125***	***3,680,459***	***3,723,503***	***3,718,921***	***3,713,762***	***3,709,775***	***3,721,948***	***3,755,788***
Timber Assets	$ 1,230,000	$ 2,460,000	$ 4,920,000	$ 7,380,000	$ 9,840,000	$ 13,530,000	$ 17,220,000	$ 20,910,000	$ 25,830,000	$ 30,750,000
minus cumulative depletion	-	-	-	-	-	-	-	-	-	-
Net Timber Assets	***$ 1,230,000***	***$ 2,460,000***	***$ 4,920,000***	***$ 7,380,000***	***$ 9,840,000***	***$ 13,530,000***	***$ 17,220,000***	***$ 20,910,000***	***$ 25,830,000***	***$ 30,750,000***
Equipment	12,900	9,843	6,785	10,128	8,570	5,513	2,455	6,598	5,840	3,583
minus depreciation	3,058	3,058	3,058	3,058	3,058	3,058	2,258	2,258	2,258	2,258
Net Equipment	***9,843***	***6,785***	***3,728***	***7,070***	***5,513***	***2,455***	***198***	***4,340***	***3,583***	***1,325***
Total Assets	**4,761,998**	**6,066,238**	**8,567,853**	**11,067,529**	**13,569,015**	**17,251,376**	**20,933,960**	**24,624,115**	**29,555,531**	**34,507,113**
Liabilities and Equity										
Accounts Payable	0	0	0	0	0	0	0	0	0	0
Deposits	$ 1,230,000	$ 2,447,000	$ 4,881,000	$ 7,289,000	$ 9,671,000	$ 13,257,000	$ 16,804,000	$ 20,312,000	$ 25,011,000	$ 29,658,000
Other Current Liabilities	0	0	0	0	0	0	0	0	0	0
Long-term Debt	0	0	0	0	0	0	0	0	0	0
Total Liabilities	***$ 1,230,000***	***$ 2,447,000***	***$ 4,881,000***	***$ 7,289,000***	***$ 9,671,000***	***$ 13,257,000***	***$ 16,804,000***	***$ 20,312,000***	***$ 25,011,000***	***$ 29,658,000***
Capitalization	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000	$ 3,500,000
Retained Earnings	$ 30,748	$ 102,488	$ 139,103	$ 171,279	$ 202,765	$ 185,126	$ 167,710	$ 157,865	$ 159,281	$ 180,863
Deposit Reserves	$ 1,250	$ 16,750	$ 47,750	$ 107,250	$ 195,250	$ 309,250	$ 462,250	$ 654,250	$ 885,250	$ 1,168,250
Total Equity	***$ 3,531,998***	***$ 3,619,238***	***$ 3,686,853***	***$ 3,778,529***	***$ 3,898,015***	***$ 3,994,376***	***$ 4,129,960***	***$ 4,312,115***	***$ 4,544,531***	***$ 4,849,113***
Total Liab. And SE	**$ 4,761,998**	**$ 6,066,238**	**$ 8,567,853**	**$ 11,067,529**	**$ 13,569,015**	**$ 17,251,376**	**$ 20,933,960**	**$ 24,624,115**	**$ 29,555,531**	**$ 34,507,113**