Residential Shoreline Loan Program Feasibility Study

Financial Analysis Memo

The Shoreline Armoring Implementation Strategy (Habitat Strategic Initiative 2018) recommended expanding financial incentives available to property owners to motivate ecologically friendly shoreline management. Puget Sound Institute (PSI), Coastal Geologic Services (CGS), and Northern Economics are conducting a feasibility study for development of a residential shoreline loan program to advance this near-term priority.

The purpose of this memo is to document the project team's work on a financial analysis of the proposed fund. The team's cost and market analysis memos (CGS 2020, PSI and CGS 2020) projected the market size and homeowner interest in loans for eligible shoreline management projects on their property. The findings of those analyses were the inputs for a financial model and simulation to determine how much funding would be needed to create a self-sustaining revolving loan fund sized to meet projected demand.

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Northern Economics

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TABLES AND FIGURES

1. PROJECT SCENARIOS

This analysis estimates potential demand for loans to implement four activities on Puget Sound waterfront residential properties (see the market analysis and cost analysis memos):

1. Removing shoreline armor (bulkhead removal): removing all or sections of hard structure on the shoreline, typically along shores where coastal erosion is not substantial or where armor serves solely as a landscaping feature
2. Installing soft shore protection: preserving the natural beach while providing erosion control, usually with natural materials
3. Elevating a home to reduce the threat from flooding and storms
4. Relocating a home to another portion of its parcel to allow the shore to recede naturally

These four activities are applied in different combinations under the following scenarios:

- remove armor
- remove armor + install soft shore
- remove armor + install soft shore + relocate home
- remove armor + install soft shore + elevate home
- remove armor + relocate home
- remove armor + elevate home
- install soft shore
- install soft shore + relocate home
- install soft shore + elevate home
- elevate home

2. MODEL AND SIMULATION

The model and simulation seek to address several questions about the loan fund and risks to successful operation of the program:

- How much seed money is needed to initially fund the program?
- What is the likelihood that the loan program fund balance is depleted such that it cannot fund new loans?
- What factors pose the greatest risk to fund sustainability?
- How does changing the distribution of the fund’s seed money affect risk?
- What areas should be researched further prior to implementing the program?

2.1 Model Specification

Table 1 summarizes the inputs used in the shoreline fund model. The upper portion of the table shows variables used in the model, which can vary between the lower and upper bounds, while the lower portion of the table shows model parameters, which remain constant.

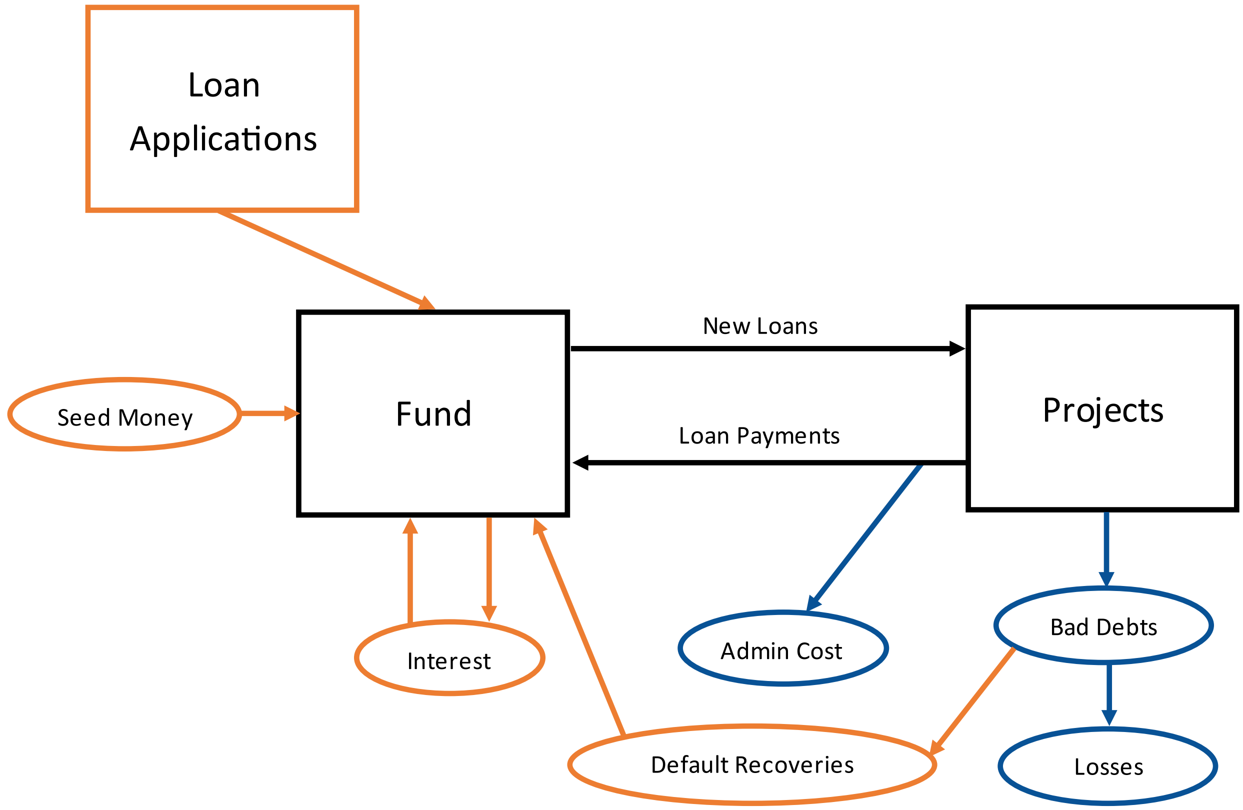
Table 1. Model Inputs

Variable or Parameter	Lower Bound	Most Likely Value(s)	Upper Bound
Variables			
Project Scenario Demand and Cost	See Table 2		
Loan Acceptance Rate (%)	72	76	95
Overage/Contingencies Rate (% of new loan principal)	-3	0	10
Loan Interest Rate (%)	2	4	6
Interest Rate on Fund Balance (% of positive fund balance)	1	1.5	2
Default Rate (% probability of loans' lifetime default risks)	5	5	10
Default Recovery Rate (% of defaulted payments)	N/A	25 or 60	N/A
Parameters			
Administrative Expenses - Small Loan (<$75,000) (% of loan)			1
Administrative Expenses - Large Loan (>$75,000) (% of loan)			2
Term (years)			15

Sources: Craft3 (Kinney 2020), AACE (2020), with assumptions by Northern Economics

The movement of money in the model is illustrated by the flowchart in Figure 1. The initial fund balance comes from seed money, but it will also accrue interest on any balance carried from year to year. Money flows out of the fund through new loans, which vary depending on the number of loans accepted, the cost of those projects, and any overages that occur. Money returns to the fund through loan payments minus the cost of administration. Some bad debts will result in losses because of defaults, but a portion will eventually return to the fund as some defaults are recovered.

Figure 1. Model Flow and Variables



The model's variables define the loan terms and risks to the fund such as project overages and loan defaults. Each of the 10 project scenarios, identified in the market and cost analysis memos (PSI and CGS 2020, CGS 2020), are also treated as variables in the model due to uncertainty in the number of projects and their cost. The simulation assumes a triangular distribution for each variable, using their bounds and most likely value.[1] The following sections provide additional detail and explanation of the model's variables and parameters.

2.2 Variables

Project Scenario Demand and Cost

The financial model uses estimates of project demand and costs, previously identified in the market and cost analysis memos, as inputs for the simulation. Table 2 shows the bounds and most likely value for the cost of each project scenario, as well as the number of potential projects.

[1] A triangular distribution is defined by minimum, mode (or most likely), and maximum values for the variable to take. The mode determines the height of the resulting triangle, and the probability of any value between the mode and the minimum or maximum decreases linearly.

Table 2. Project Scenario Cost Inputs

Project Scenario	Number of Projects	Lower Bound ($)	Most Likely Value ($)	Upper Bound ($)
elevate home	9	60,000	100,000	140,000
install soft shore + relocate home	7	54,910	158,185	321,300
install soft shore*	16	20,800	51,100	143,800
install soft shore + elevate home	20	68,680	128,435	241,230
remove armor + elevate home	5	79,305	145,350	236,385
remove armor	2	33,300	71,000	138,100
remove armor + install soft shore + relocate home	5	84,150	198,730	324,445
remove armor + install soft shore	24	55,200	98,800	147,500
remove armor + install soft shore + elevate home	23	97,920	168,980	244,375
remove armor + relocate home	1	65,635	175,100	316,455

Note: * The analysis assumes that 5 percent of the total number of potential "install soft shore" projects are likely to proceed, which results in an estimate of 16 projects.
Sources: Market Analysis Memo (PSI and CGS 2020), Cost Analysis Memo (CGS 2020)

Loan Acceptance Rate

The number of projects that result in loans is reduced by the loan acceptance rate, which varies from 72 to 95 percent. This is based, in part, on model scenarios developed by the Washington State Department of Health (2014) for a regional on-site sewage loan program. The "conservative" scenario (75%) had stricter loan acceptance criteria and a lower default rate (8%), while the "inclusive" scenario (95%) had less strict criteria and a higher default rate (10%). Average historical acceptance rates from the Clean Water Loans program run by Craft3, a Community Development Financial Institution, were 72 percent (2002–2013) and 76 percent (2018–2020). From these two sources, we develop a distribution of loan acceptance rates that ranges from 72 to 95 percent with a most likely value of 76 percent.

The number of projects within each scenario is distributed evenly across the model's 15-year analysis period, and the first loans are withdrawn from the fund in 2021. Project costs are inflated according to the US Army Corps of Engineers Bank Stabilization index, which is the same index used by Coastal Geologic Services.

Overages/Contingency Rate

Contingencies are typically used to account for overages that may occur on a project; however, it is possible for a project to be completed under budget. The simulation assumes that the overages/contingency rate ranges from -3 percent (under budget) to 10 percent (over budget), where 0 is the most likely value. These assumptions align with the expected accuracy range for a class 1 estimate, described in the Association for the Advancement of Cost Engineering's (AACE) estimation guide (AACE 2020).

Loan Interest Rate

The simulation assumes the loan interest rate ranges from 2 to 6 percent, with a most likely value of 4 percent. This is based on historical rates used by the Washington State Department of Health (2014) for a regional on-site sewage loan program modeling.

Interest Rate on Fund Balance

When the shoreline fund has a positive balance, it will accrue interest. The simulation assumes the interest rate ranges from 1 to 2 percent with a most likely value of 1.5 percent.

Defaults (Rate and Recoveries)

We assume that each loan has the same probability of defaulting in each year of the loan life. The default rate ranges from 5 to 10 percent over the life of the loan; Craft3 indicated the most likely value is 5 percent (Kinney 2020). When a default occurs, all subsequent payments (including interest and principal) are written off each year, and the defaulted loans no longer incur administrative costs to the fund.

Loans in the shoreline fund will likely be secured, and defaulted loans could be partially recovered in the future if a lien is on file when the property is sold. The simulation estimates these recoveries by assuming that a percentage of the defaulted principal balance is added back into the fund five years after default. Federal research shows that following the 2008 recession, mortgage loss severities on defaulted single-family home loans have remained around 40 percent (An and Cordell 2019). We conducted two versions of the simulation to test the sensitivity of the model to default recoveries: one where the recovery rate was 25 percent, and one where it was 60 percent corresponding to the observed 40 percent loss rate.

2.3 Parameters

Administrative Costs

Administrative costs are constant throughout the simulations and calculated as a percentage of the loan principal payments each year. Rates were provided by Craft3. If the loan is greater than $75,000 the administrative costs are 2 percent and if the loan is less than $75,000 the costs are 1 percent (Kinney 2020).

Loan Term

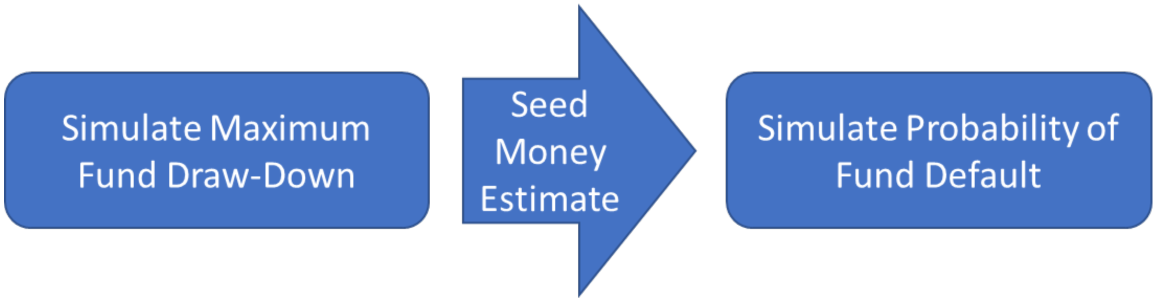
Each loan from the shoreline fund is on a 15-year term, and the analysis period for the model is also 15 years.

2.4 Simulation Method

To evaluate the impact of each variable in the model, we used the Microsoft Excel-based software @Risk to run a simulation with 5,000 iterations. In each iteration of the simulation, the program randomly selected input values for each of the variables and records the resulting outcome. Comparing the outcome of each iteration of the simulation reveals the expected distribution of outcomes and the variables that have the most impact on fund balance.

The goal of the financial analysis is to identify the amount of seed money needed in year 1 to create a self-sustaining fund. We used a two-step approach, shown below in Figure 1, to look at the fund's balance and see the effects of the requested loans on the fund.

Figure 2. Shoreline Fund Analysis Method



The first step of the analysis was to determine the maximum draw on the fund by running a set of simulations without a starting fund balance. The maximum draw is the largest negative end-of-year balance observed during each iteration of the simulation, and takes into account all sources of income, expenses, and losses previously discussed in this memo. From this simulation, we set a seed money amount (starting balance) based on the 95 percent confidence level for the maximum draw. Based on that amount, only 5 percent of the simulation's 5,000 iterations had a fund draw that would have exceeded the seed money.

The second step of the analysis simulated the probability of fund default using the seed money estimates from step one. In the second step, we added the seed money to the model in year 1 and allowed the fund to earn interest on the positive fund balance each year. We conducted two new simulations with the modified model (cases 1 and 2) and reported the estimated probability that the seed money would be depleted during the 15-year analysis period.

After completing the baseline analyses described above, we investigated additional issues that might impact the fund's operation. For example, we investigated how the fund would be impacted by distributing the initial seed money over a period of several years instead of a lump sum in the first year of operation. We constructed a third set of simulations (cases 3 and 4) to model the fund when the seed money is evenly distributed over nine years or incrementally distributed over seven years.

We also conducted a sensitivity analysis using the simulation data that revealed which variables in the model have the biggest impact on the simulated fund. The variables each have a range of possible input values and can therefore increase or decrease the likelihood that the fund balance is depleted. @Risk compares all the possible outcomes from the model and isolates the potential impact due to each individual variable. The resulting analysis creates a ranking of the variables and shows how the range of inputs relates to a range for the fund balance.

Lastly, we investigated threats to the long-term sustainability of the fund and discussed the best strategies for the fund. Some of the additional investigation topics, discussed in the

Conclusions section, include liens and default recovery methods, maintaining a minimum fund balance, and expectations for utilization of the shoreline fund program.

The memo appendices show examples of the model output for each of the three simulation conditions used in the analysis:

1. Simulate fund maximum draw down (Appendix 1)
2. Simulate probability of fund default with year 1 lump sum seed money funding (Appendix 2)
3. Simulate probability of fund default with distributed seed money funding (Appendix 3)

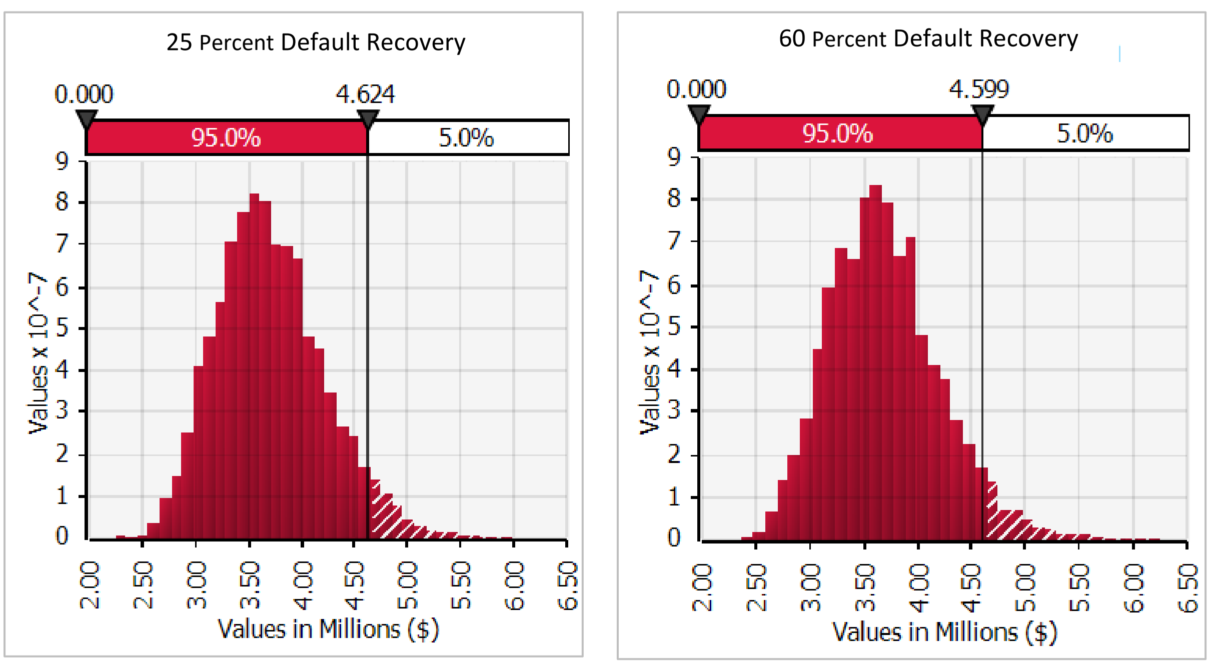
Parts A and B of each appendix show a single iteration of the simulation using the most likely values for each of the model variables, and part C shows the mean and confidence interval based on all iterations of the simulation.

3. SIMULATION RESULTS

3.1 Simulate Maximum Fund Draw

As noted in the section titled *Defaults (Rate and Recoveries)*, we simulated the maximum draw on the fund with default recovery rates of 25 percent and 60 percent. Figure 2 shows the distribution of the modeled fund balances over 5,000 iterations for both simulations. We report the one-sided 95 percent confidence interval for the simulations (shown in the charts as a vertical line), which represents the point where only 5 percent of the iterations have a larger fund draw-down.

Figure 3. Simulation Maximum Fund Draw-Down Distributions



When the default recovery rate was 25 percent, the maximum fund draw ranged from $2.2 million to $6.0 million, with a 95 percent confidence interval estimate of $4.6 million. When the default recovery rate was 60 percent, the maximum fund draw ranged from $2.4 million to $6.3 million, with a 95 percent confidence interval estimate of $4.6 million. These results show that if the fund were to start out with $4.6 million in seed money it would be enough to cover the requested loans 95 percent of the time.

3.2 Simulate Probability of Fund Default

We used the 95 percent confidence interval estimate (rounding down to $4.5 million) from the previous simulations as the seed money estimate for the second step of the analysis. We conducted two new simulations that included seed money and interest earned based on the fund balance, which increases the fund's sustainability (see Table 3).

With $4.5 million in seed money and a 25 percent default recovery rate, the fund has a 3.6 percent probability that the requested loans would exceed the fund balance during the first 15 years of issuing loans from the fund. Interest earnings generated additional income for the fund and offset the burden from defaults and administrative costs. Without fund interest earnings, the fund with $4.5 million in seed money and a 25 percent default recovery rate would have an approximately 5.0 percent probability of being depleted, so the interest earnings effectively decreased the probability by 1.4 percent. If the default recovery rate is 60 percent, the probability of depleting the fund further decreases to 3.5 percent (see Table 3). This analysis shows that the effect of increasing the default recovery rate from 25 to 60 percent is relatively small, decreasing the odds of fund default by about one-tenth of a percent. The remainder of the analysis in this memo focuses only on the conservative 25 percent recovery rate.

Table 3. Simulation Results and Likelihood of Depleted Fund

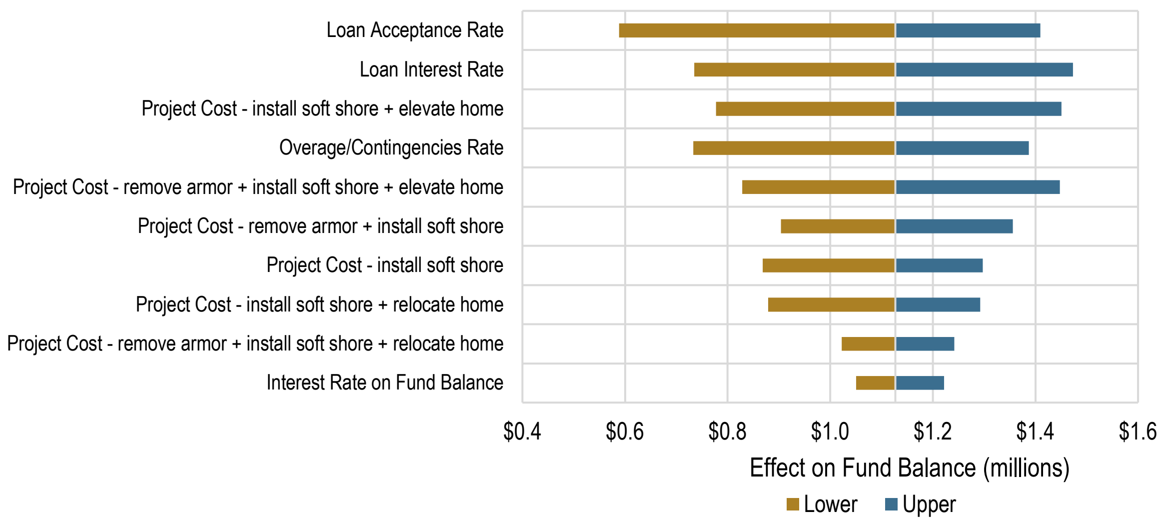
Case	Seed Money ($)	Default Recovery Rate (%)	Simulated Probability (%) of Negative Fund Balance
1	4,500,000	25	3.6
2	4,500,000	60	3.5

Sensitivity Analysis

Simulation results provide information about the sensitivity of the outcome to changes in the variables discussed in the *Variables* section. Figure 3 shows the potential range of impact on the minimum fund balance for each of the 10 most influential variables in simulation Case 1. The loan acceptance rate and loan interest rate are the two most influential variables in the simulations, and the values are compared to a baseline of $1,126,944, where each variable takes its most likely value. The loan acceptance rate (ranging from 95 to 72 percent in the simulation) has the potential to decrease the fund balance to as low as $590,000 or increase it to as much as $1.4 million. Similarly, the loan interest rate (ranging from 2 to 6 percent in the simulation) could decrease the minimum balance to $730,000 or increase it to nearly $1.5 million. In combination, the two variables could cause the fund balance to be negative if the acceptance rate were high and the interest rate was low.

Six of the variables ranking in the top-10 list are project cost variables, indicating that the uncertainty in cost estimates could have a large overall effect on the fund. In particular, we notice that the project scenarios with home elevating are the most influential of the project cost variables. For project costs, the range of impacts is large because of relatively little historical data on these projects, and the model reflects this uncertainty. The influence of the project cost variables could be mitigated through fund management or strategy. Projects with high-cost activities, like home elevating or relocating, could be excluded from the program.

Figure 4. Most Influential Model Variables for Case 1 Simulation



Note: Effect on fund balance compared to a baseline of $1,126,944.

3.3 Distributed Seed Money Model

An additional investigation shows what would happen to the fund if the seed money were distributed over several years rather than as a lump sum in year 1. We tested two cases and the results of both simulations are shown below in Figure 5. Both simulation case 3 and 4 assume $4.5 million in total seed money funding and a 25 percent default recovery rate.

Figure 5. Distributed Seed Money Model Schedule

Year	Case 3 Seed Funding ($)	Case 4 Seed Funding ($)
1	500,000	1,000,000
2	500,000	1,000,000
3	500,000	500,000
4	500,000	500,000
5	500,000	500,000
6	500,000	500,000
7	500,000	500,000
8	500,000	0
9	500,000	0
10	0	0
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0

Note: Cases 3 and 4 assume a default recovery rate of 25 percent.

Case 3 evenly distributes the seed money in $500,000 increments from year 1 through year 9, and the simulation shows that there is a 71.2 percent chance that the fund balance will dip below zero during the 15-year analysis period. Further investigation into the results of the case 3 simulation shows that the minimum balance occurs in year 4 71.7 percent of the time. Although the total amount of seed funding is still $4.5 million, the demand for new loans early in the analysis period exceeds the available funding. This could be prevented through management of the fund and limiting the number of new loans, or it could be avoided by adjusting the seed money distribution schedule. Case 4 represents a modified approach to distributing the seed money, shifting a portion of the funding to years 1 and 2, when the program has only a few outstanding loans and earns relatively little income from loan interest. When the seed money is increased to $1.0 million in years 1 and 2, the probability of a fund overdraw decreases to 5.4 percent.

4. Conclusions and Recommendations

The financial model measures the maximum draw on the fund over the first 15 years of issuing loans. A series of simulations takes into account the uncertainty in variables related to the fund, including terms of the loans, loan defaults, and the project scenarios. The analysis shows that the fund would likely meet the expected project needs with initial seed funding of $4.5 million. The loan interest rate and the loan acceptance rate are the most influential variables in the simulations. Uncertainty in costs for some of the project scenarios, such as home elevation, and the overages/contingency rate also have a significant effect on the fund balance. We recommend that further research into project costs could refine the seed money estimate produced by the financial model.

Craft3 indicated that they secure loans less than $100,000 by Uniform Commercial Code (UCC) and greater than $100,000 by Deed of Trust (Kinney 2020). The analysis described in this memo assumes that a percentage (varying by simulation) of the principal balance of defaulted loans is recovered five years after the default occurred. It could take much longer to recover the losses depending on how the loan is secured, the method or type of lien that is placed, and whether the lien can be used to force foreclosure. If the liens are not removed until the sale occurs naturally, such as the death of a homeowner and liquidation of an estate, it could take much longer than five years. We recommend conducting additional research on the methods of securing loans for the shoreline fund and what can be expected in terms of default rates and recoveries.

The simulations showed that, while unlikely, it is possible for the maximum draw on the fund to reach as much as $6.3 million, which exceeds our seed money estimates by 40 percent. Fund sustainability will require that the fund balance be carefully managed. Fund expenses and loan default losses could exceed loan interest earnings, and there could be other conditions within the current model specification that would also cause the fund to become unsustainable. For example, a high rate of loan defaults or a low default recovery rate could negatively impact the fund. The financial model also assumes that the expected loans within each project scenario are evenly distributed throughout the analysis period, but rising sea levels or the level of awareness about the loan program over time may affect how many people apply for loans. These issues are exacerbated by the low number of outstanding loans for the program, making the program vulnerable to random events such as defaults on high-cost projects. Many of these logistic issues could be mitigated by monitoring the health of the fund over time. For example, if the program experiences a higher-than-expected default rate, it could deliberately reduce the loan acceptance rate and reduce the number of new loans, relieving some of the demand on the fund. Maintaining a minimum fund balance will help to offer some security by providing a buffer against defaults and generating fund interest earnings. The fund manager should monitor the fund's projected balance and employ measures to close the fund to new loans as needed to maintain a sustainable minimum fund balance.

The financial model reflects what would happen to the fund given a fixed set of conditions and does not account for proactive management. Many of the iterations in the simulation where the fund is depleted could be foreseen and mitigated by an experienced manager. Furthermore, the model assumes all project types are equal, but a management strategy could be developed to deliberately target smaller projects. If the fund targeted the less expensive shoreline and habitat restoration projects—as opposed to home relocation and elevation projects—it could support a larger number of individual loans. Strategizing could allow the program to meet goals outside the scope of this analysis.

5. REFERENCES

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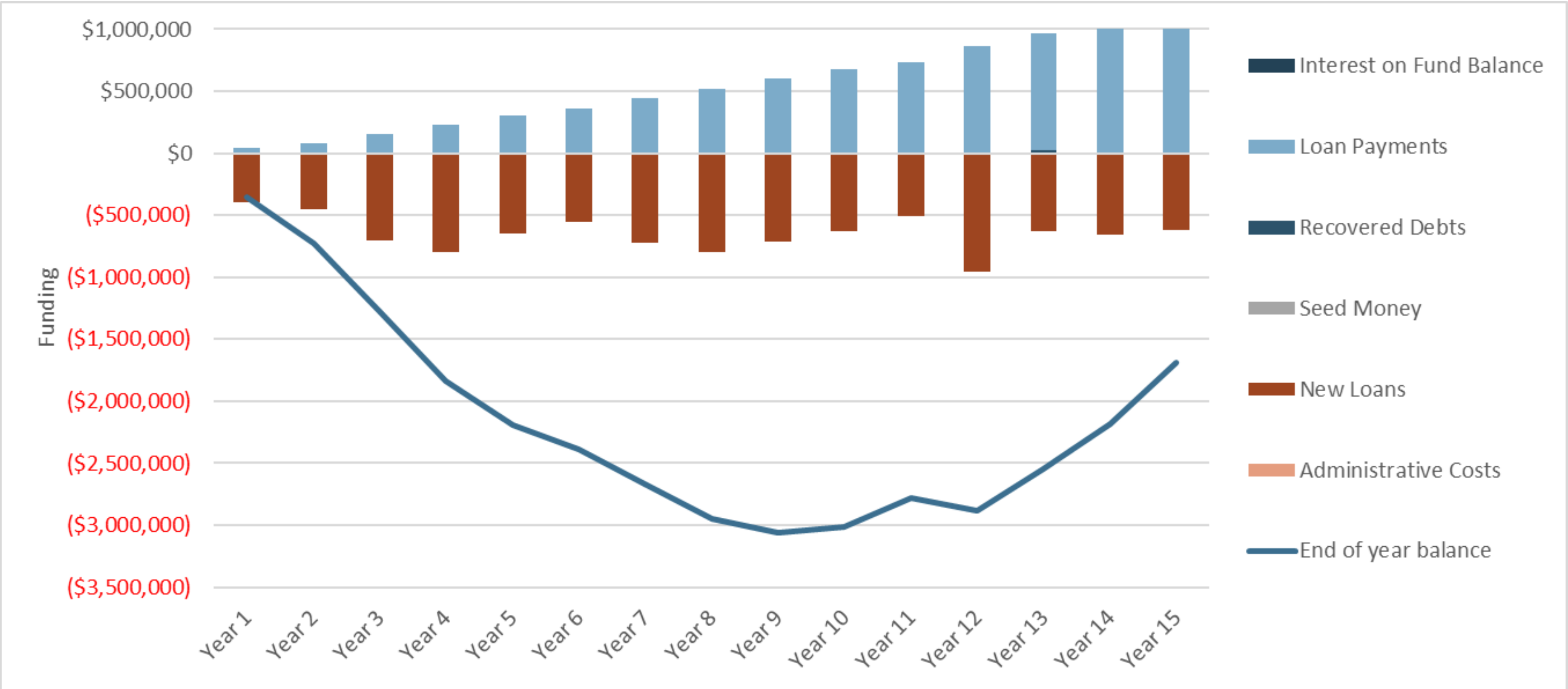
APPENDICES

Appendix 1-A: Fund Maximum Draw Financial Model Summary Table

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	1,000s of Dollars														
Seed Money	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
New Loans	**(396.2)**	**(447.3)**	**(705.5)**	**(791.4)**	**(646.1)**	**(554.4)**	**(716.3)**	**(791.4)**	**(705.5)**	**(617.1)**	**(496.2)**	**(949.6)**	**(616.3)**	**(646.1)**	**(605.5)**
Base Amounts	(396.2)	(447.3)	(705.5)	(791.4)	(646.1)	(554.4)	(716.3)	(791.4)	(705.5)	(617.1)	(496.2)	(949.6)	(616.3)	(646.1)	(605.5)
Overages/ Contingencies	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Administrative Costs	**(0.4)**	**(0.9)**	**(1.7)**	**(2.6)**	**(3.5)**	**(4.3)**	**(5.4)**	**(6.3)**	**(7.5)**	**(8.6)**	**(9.6)**	**(11.4)**	**(12.7)**	**(14.2)**	**(15.7)**
Loan Payments	**37.5**	**81.0**	**151.6**	**233.2**	**301.7**	**362.2**	**442.6**	**514.5**	**598.4**	**673.8**	**736.3**	**859.3**	**941.4**	**1,030.0**	**1,115.5**
Interest	16.5	34.8	64.1	96.4	121.0	140.3	166.7	195.7	218.8	235.8	244.7	278.0	289.8	301.4	308.6
Principal	21.0	46.2	87.6	136.8	180.7	221.9	275.9	338.3	399.0	457.5	511.1	600.8	671.2	748.1	826.4
Bad Debts	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(19.5)	(19.5)	(19.5)	(19.5)	(19.5)	(19.5)	(19.5)	(19.5)
Recovered Debts	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**25.6**	**0.0**	**0.0**
Interest on Fund Balance	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Year Total	**(359.2)**	**(367.2)**	**(555.6)**	**(560.9)**	**(347.9)**	**(196.5)**	**(279.1)**	**(283.2)**	**(114.6)**	**48.2**	**230.5**	**(101.6)**	**338.1**	**369.7**	**494.3**
End of year balance	**(359.2)**	**(726.4)**	**(1,281.9)**	**(1,842.8)**	**(2,190.7)**	**(2,387.2)**	**(2,666.3)**	**(2,949.5)**	**(3,064.2)**	**(3,016.0)**	**(2,785.6)**	**(2,887.2)**	**(2,549.1)**	**(2,179.4)**	**(1,685.1)**

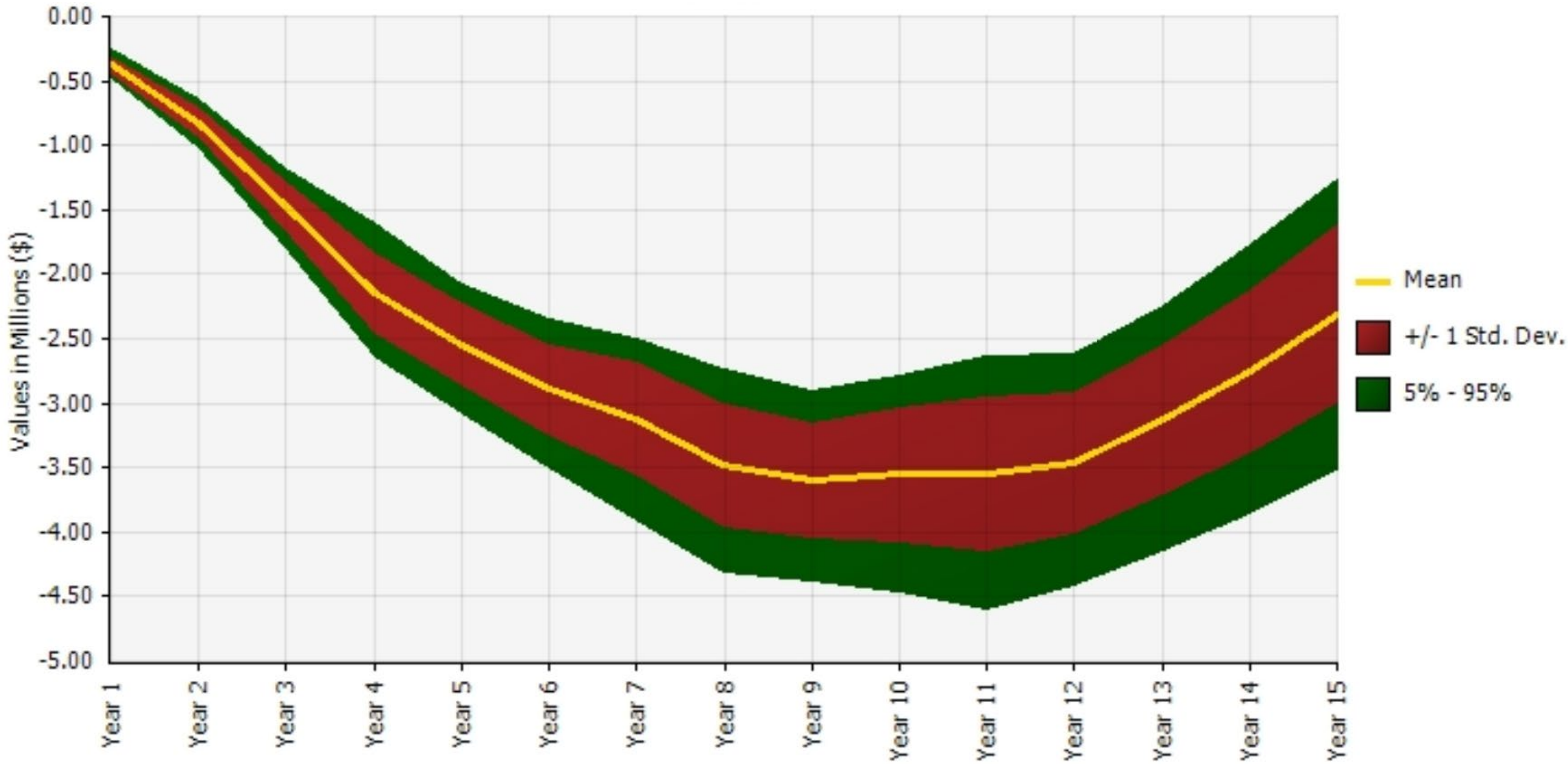
Note: The table data represent a single iteration from the simulation.

Appendix 1-B: Fund Maximum Draw Financial Model Summary Chart



Note: The figure represents a single iteration from the simulation.

Appendix 1-C: Fund Maximum Draw Financial Model Simulation Year End Fund Balance

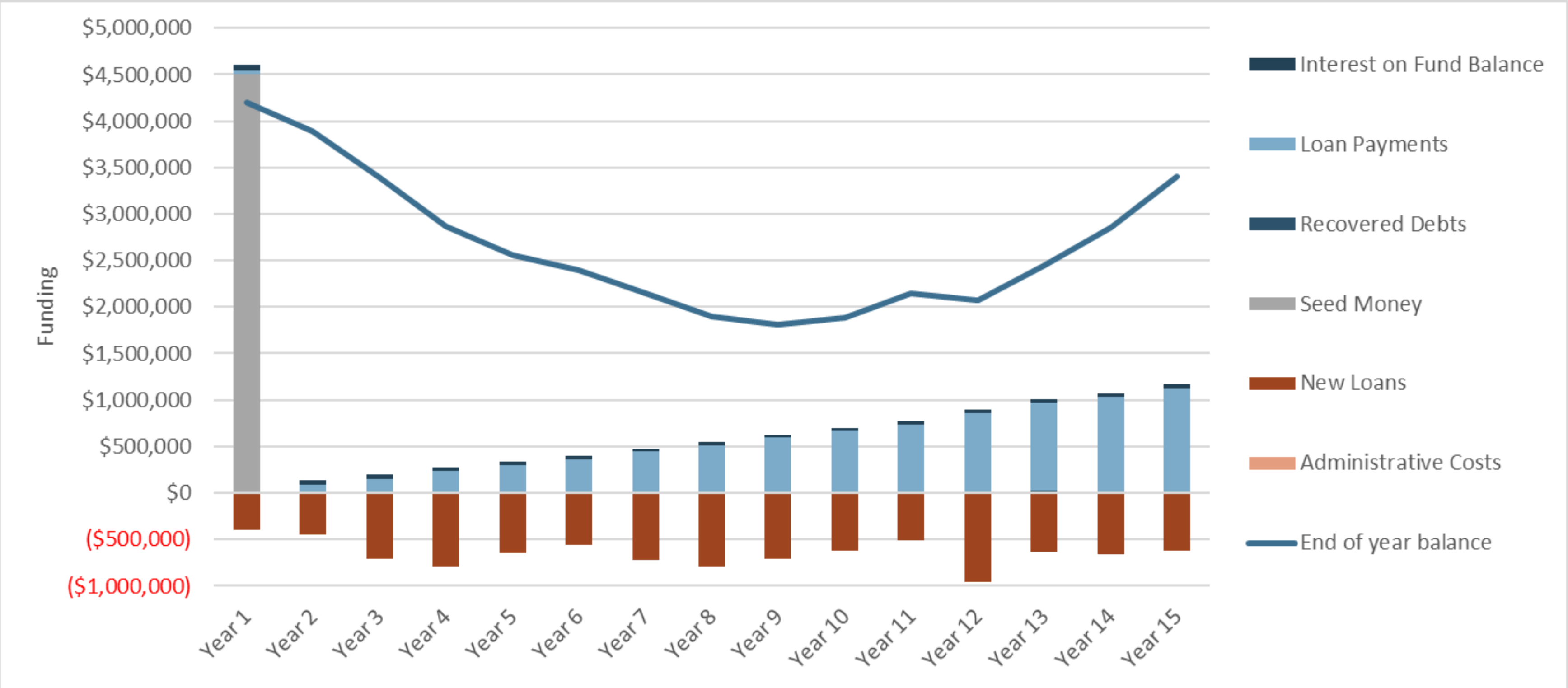


Appendix 2-A: Lump Sum Seed Money Fund Financial Model Summary Table

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	1,000s of Dollars														
Seed Money	**4,500.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
New Loans	**(396.2)**	**(447.3)**	**(705.5)**	**(791.4)**	**(646.1)**	**(554.4)**	**(716.3)**	**(791.4)**	**(705.5)**	**(617.1)**	**(496.2)**	**(949.6)**	**(616.3)**	**(646.1)**	**(605.5)**
Base Amounts	(396.2)	(447.3)	(705.5)	(791.4)	(646.1)	(554.4)	(716.3)	(791.4)	(705.5)	(617.1)	(496.2)	(949.6)	(616.3)	(646.1)	(605.5)
Overages/ Contingencies	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Administrative Costs	**(0.4)**	**(0.9)**	**(1.7)**	**(2.6)**	**(3.5)**	**(4.3)**	**(5.4)**	**(6.3)**	**(7.5)**	**(8.6)**	**(9.6)**	**(11.4)**	**(12.7)**	**(14.2)**	**(15.7)**
Loan Payments	**37.5**	**81.0**	**151.6**	**233.2**	**301.7**	**362.2**	**442.6**	**514.5**	**598.4**	**673.8**	**736.3**	**859.3**	**941.4**	**1,030.0**	**1,115.5**
Interest	16.5	34.8	64.1	96.4	121.0	140.3	166.7	195.7	218.8	235.8	244.7	278.0	289.8	301.4	308.6
Principal	21.0	46.2	87.6	136.8	180.7	221.9	275.9	338.3	399.0	457.5	511.1	600.8	671.2	748.1	826.4
Bad Debts	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(19.5)	(19.5)	(19.5)	(19.5)	(19.5)	(19.5)	(19.5)	(19.5)
Recovered Debts	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**25.6**	**0.0**	**0.0**
Interest on Fund Balance	**62.1**	**57.5**	**50.1**	**42.4**	**37.8**	**35.4**	**31.8**	**28.0**	**26.7**	**27.8**	**31.7**	**30.7**	**36.2**	**42.3**	**50.3**
Year Total	**4,202.9**	**(309.7)**	**(505.5)**	**(518.4)**	**(310.1)**	**(161.1)**	**(247.3)**	**(255.2)**	**(87.9)**	**76.0**	**262.2**	**(71.0)**	**374.3**	**412.0**	**544.6**
End of year balance	**4,202.9**	**3,893.3**	**3,387.8**	**2,869.3**	**2,559.2**	**2,398.2**	**2,150.9**	**1,895.7**	**1,807.7**	**1,883.7**	**2,145.9**	**2,074.9**	**2,449.2**	**2,861.2**	**3,405.8**

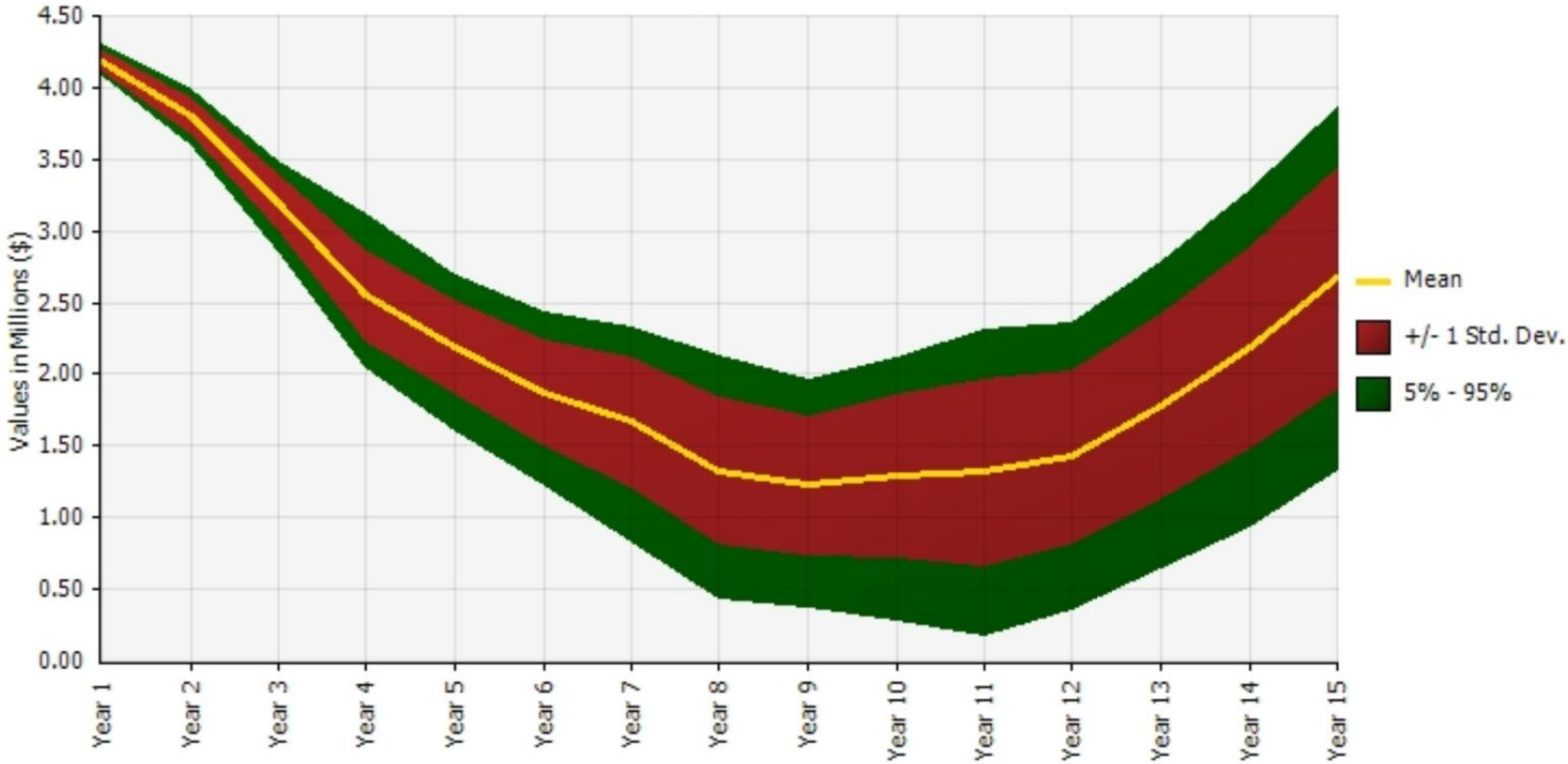
Note: The table data represent a single iteration from the simulation.

Appendix 2-B: Lump Sum Seed Money Fund Financial Model Summary Chart



Note: The figure represents a single iteration from the simulation.

Appendix 2-C: Lump Sum Seed Money Fund Financial Model Simulation Year End Fund Balance

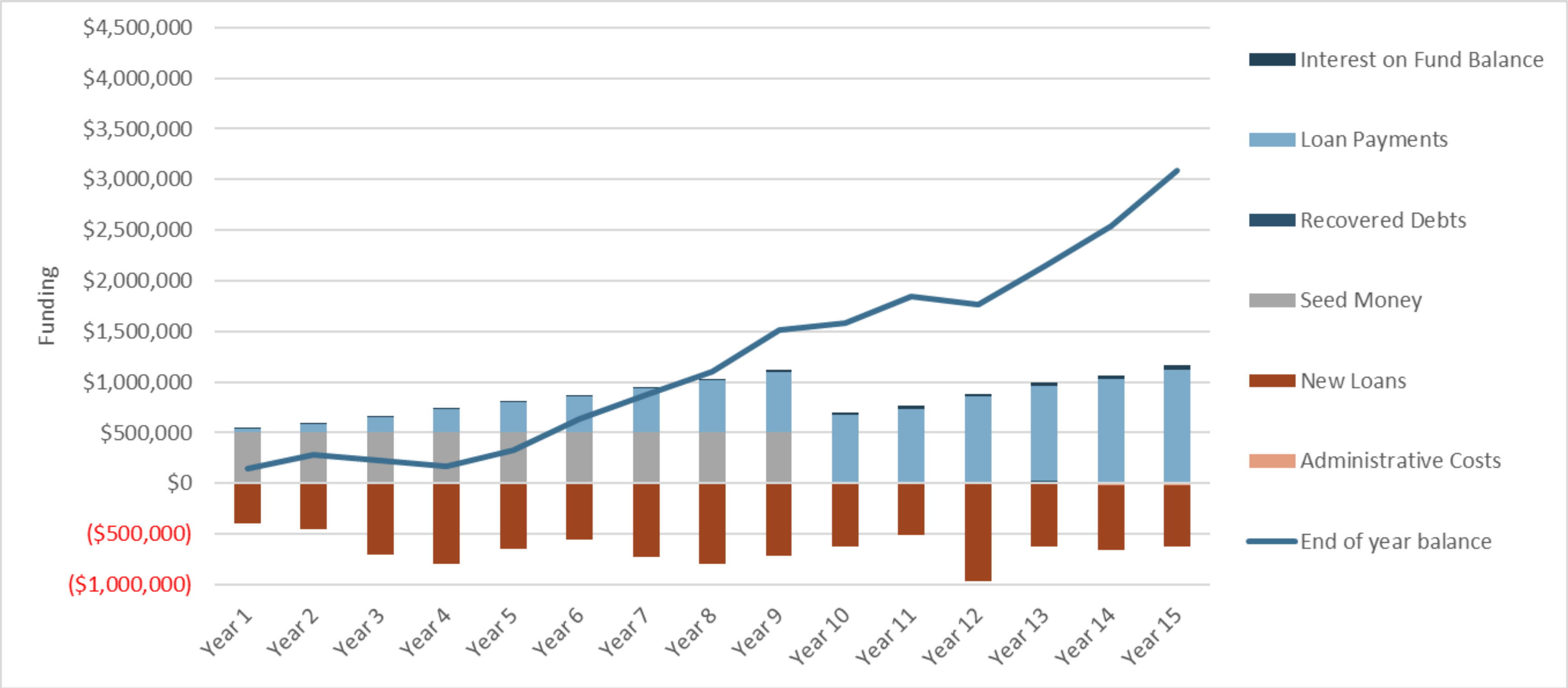


Appendix 3-A: Distributed Seed Money Fund Financial Model Summary Table

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	1,000s of Dollars														
Seed Money	**500.0**	**500.0**	**500.0**	**500.0**	**500.0**	**500.0**	**500.0**	**500.0**	**500.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
New Loans	**(396.2)**	**(447.3)**	**(705.5)**	**(791.4)**	**(646.1)**	**(554.4)**	**(716.3)**	**(791.4)**	**(705.5)**	**(617.1)**	**(496.2)**	**(949.6)**	**(616.3)**	**(646.1)**	**(605.5)**
Base Amounts	(396.2)	(447.3)	(705.5)	(791.4)	(646.1)	(554.4)	(716.3)	(791.4)	(705.5)	(617.1)	(496.2)	(949.6)	(616.3)	(646.1)	(605.5)
Overages/ Contingencies	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Administrative Costs	**(0.4)**	**(0.9)**	**(1.7)**	**(2.6)**	**(3.5)**	**(4.3)**	**(5.4)**	**(6.3)**	**(7.5)**	**(8.6)**	**(9.6)**	**(11.4)**	**(12.7)**	**(14.2)**	**(15.7)**
Loan Payments	**37.5**	**81.0**	**151.6**	**233.2**	**301.7**	**362.2**	**442.6**	**514.5**	**598.4**	**673.8**	**736.3**	**859.3**	**941.4**	**1,030.0**	**1,115.5**
Interest	16.5	34.8	64.1	96.4	121.0	140.3	166.7	195.7	218.8	235.8	244.7	278.0	289.8	301.4	308.6
Principal	21.0	46.2	87.6	136.8	180.7	221.9	275.9	338.3	399.0	457.5	511.1	600.8	671.2	748.1	826.4
Bad Debts	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(19.5)	(19.5)	(19.5)	(19.5)	(19.5)	(19.5)	(19.5)	(19.5)
Recovered Debts	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**25.6**	**0.0**	**0.0**
Interest on Fund Balance	**2.1**	**4.1**	**3.4**	**2.5**	**4.8**	**9.4**	**12.9**	**16.3**	**22.4**	**23.4**	**27.2**	**26.1**	**31.6**	**37.6**	**45.6**
Year Total	**142.9**	**136.9**	**(52.2)**	**(58.4)**	**156.9**	**312.9**	**233.8**	**233.1**	**407.7**	**71.6**	**257.7**	**(75.5)**	**369.6**	**407.3**	**539.9**
End of year balance	**142.9**	**279.9**	**227.7**	**169.3**	**326.2**	**639.2**	**873.0**	**1,106.1**	**1,513.8**	**1,585.4**	**1,843.1**	**1,767.6**	**2,137.2**	**2,544.6**	**3,084.5**

Note: The table data represent a single iteration from the simulation.

Appendix 3-B: Distributed Seed Money Fund Financial Model Summary Chart



Note: The figure represents a single iteration from the simulation.

Appendix 3-C: Distributed Seed Money Fund Financial Model Simulation Year End Fund Balance