

# The Benefits of Investing In Conservation... ...and the Costs of Not Investing



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# Soil is the Biological Capital of Production

Is your soil capital  
**appreciating** through  
soil building?



Is your soil capital  
**depreciating** through  
erosion, compaction, or loss  
of organic matter?

# Maintaining Soil Quality

= Increased Efficiency of Inputs

= Water Quality Protection



- = increased irrigation efficiency (lower pumping costs)
- = improved nutrient efficiency (lower fertilizer costs)
- = less wind and water erosion (lower clean-up costs)
- = increased water infiltration (less runoff & flooding)
- = improved soil tilth (reduced tillage operations)
- = deeper rooting depth and crop growth (higher yields)

Investing in the soil makes good business sense.....

.....And it protects water quality!

# How do you know if you are loosing soil capital?



Soil forms at a rate of 2 to 5 tons per year per acre.

You can't see soil erosion of less than 15 tons per acre per year.

But that is 3 to 5 times more than the natural rate of soil formation.

2 out of every 9 acres of irrigated farm land in California are losing soil faster than it can be formed.

# Internal vs. External Costs

## Internalized Costs: Financial costs to the business

- Crop loss or decline in productivity
- Increased cost of production inputs
- Damage repair
- Investments in land and property

## Externalized Costs: Economic costs to society

- Repair and maintenance of public infrastructure
- Impairment of water quality  
(loss of beneficial use)
- Loss of fisheries or wildlife habitat



# 1. On farm damage and lost productivity



## 2. Damage to Private Property Downstream



**Runoff impacts**



**Sediment impacts**

# 3. Damage to public property





# Sediment filled ditches and culverts increase flooding

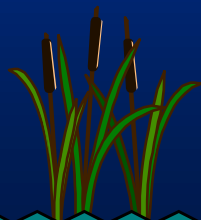


## 4. Non-monetary External Costs



# Summary of Economic Impacts of Erosion in North Monterey County

	<u>Annual Costs</u>
Long-term road impacts	\$ 160,000
Road maintenance	24,000
Public land impacts	10,350
Loss of Wetlands	10,000
Mosquito Abatement	6,270
Harbor Dredging	1,750,000
Drinking Water Quality	<u>290,000</u>
<b>TOTAL:</b>	<b>\$570,620</b>
Cost per Elkhorn farmer:	\$2,282
Recreational Value	2,000,000
Flood Control	70,000
Commercial Fisheries	??



# Invest in conservation rather than paying the costs of regulations, fines, and lawsuits



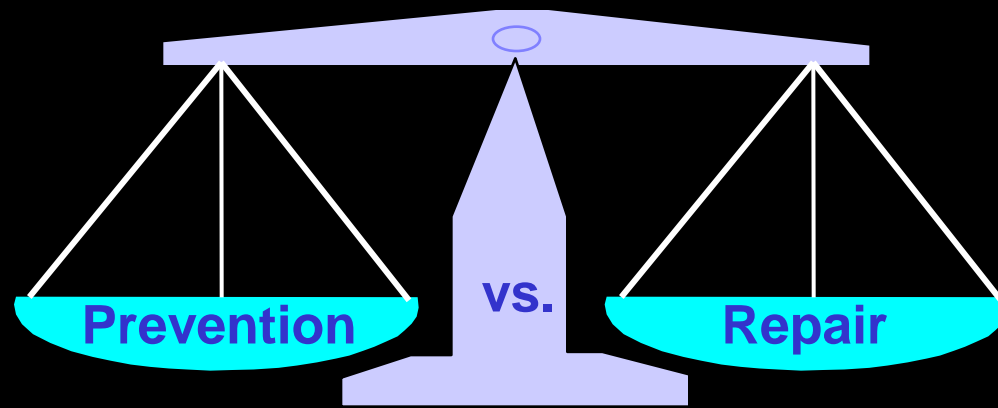
Elkhorn Road turn lane damage from farm runoff



\$25,000



**Sediment Basin: \$5,000**



# Vegetated Ditch Planting Investment vs. Annual Ditch Repair





**Consider the  
cost of maintenance  
when comparing alternatives**





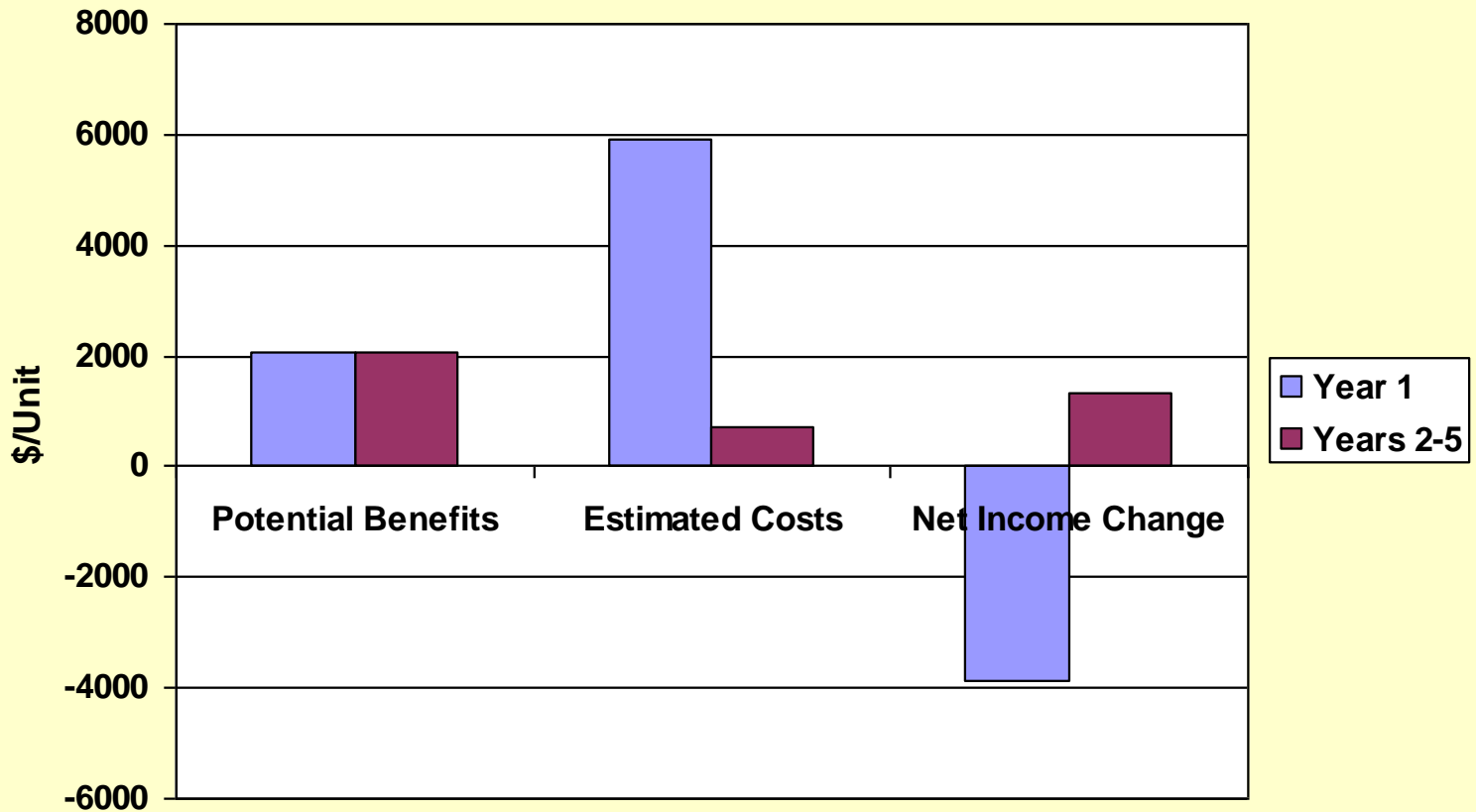
# Underground Outlet – Partial Budget Summary 400 linear feet

Costs			Benefits		
Additional Costs	Year 1	Year 2-5	Additional Returns	Year 1	Year 2-5
Installation, Operation & Maintenance	5,348	156	Yield Improvement	1,408	1,408
Reduced Returns (acreage removed)	570	570	Reduced Costs (prevention and repair)	650	650
<b>Subtotal</b>	<b>\$5,918</b>	<b>\$726</b>	<b>Subtotal</b>	<b>\$2,058</b>	<b>\$2,058</b>

	Year 1	Year 2-5
<b>Net Change in Income</b>	<b>-\$3,860</b>	<b>\$1,332</b>

# Estimating Costs and Potential Benefits Example

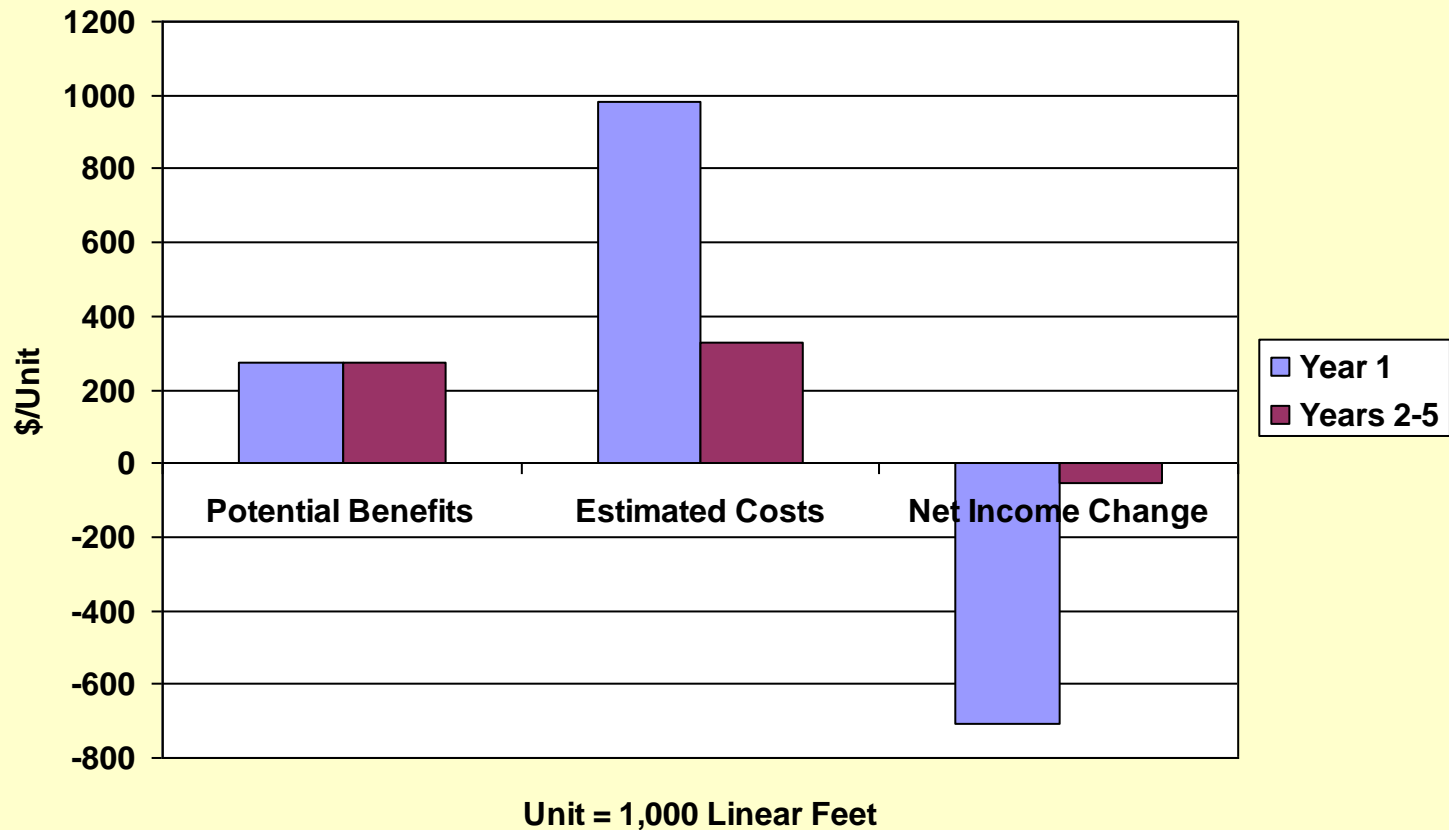
Underground Outlet - Representative Scenario  
Partial Budget Summary - Graphic Format (see study table 1)



Unit = 400 Linear Feet

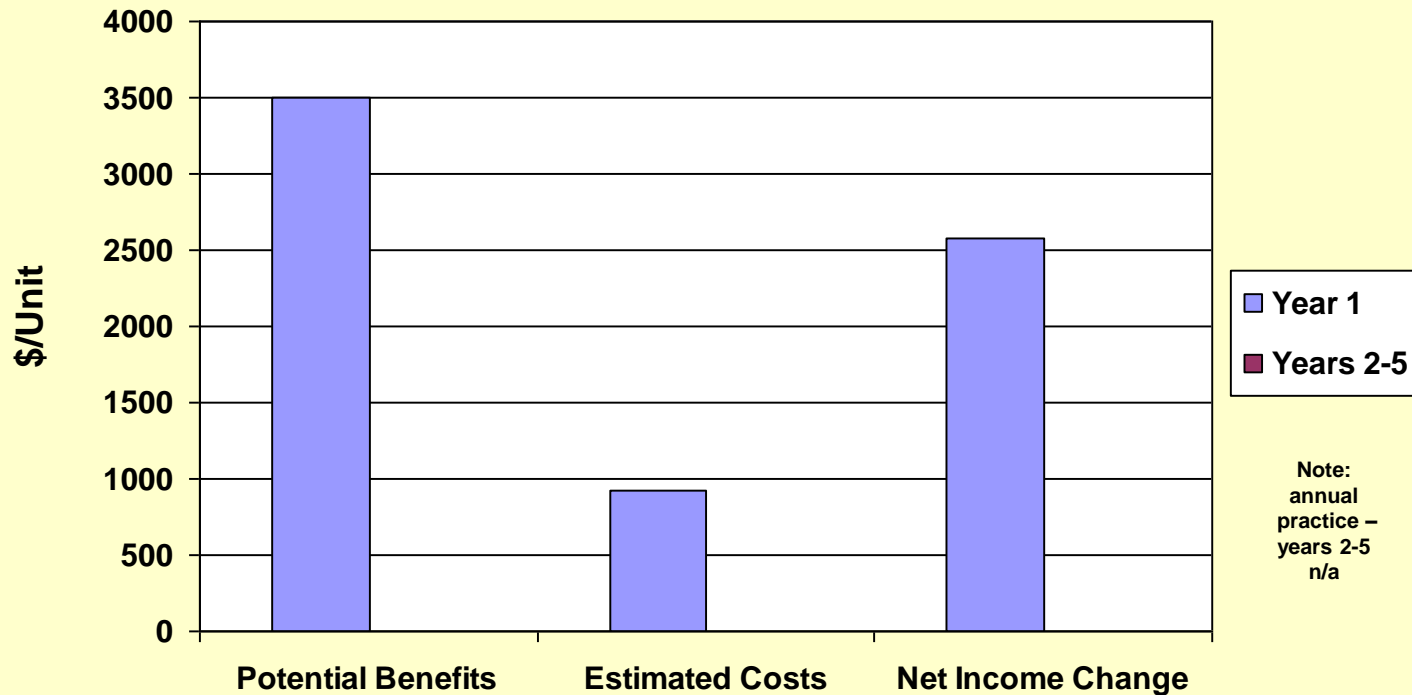
# Estimating Costs and Potential Benefits Example

Non-Engineered Grassed Waterway - Representative Scenario  
Partial Budget Summary - Graphic Format (see study table 1)



# Estimating Costs and Potential Benefits Example

On-Farm Row Arrangement - Representative Scenario  
Partial Budget Summary - Graphic Format (see study table 1)



Unit = 25 Acre Parcel

Note:  
annual  
practice –  
years 2-5  
n/a



# Why Costs & Benefits May Differ...

## *Examples:*

- Labor rates
- Equipment type and use
- Material type and cost
- Slope of land and erosion potential
- ‘Suite’ of on-farm conservation practices
- Number of storm events per year





## U.C. COOPERATIVE EXTENSION

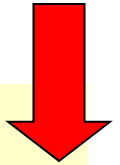


Table 2. Detail of Representative Installation, Operation & Maintenance Costs†  
Underground Outlet (400 Linear Feet) – Central Coast 2003

Operation	Non-Mach Labor		Machine Labor		Custom Work		Material Cost (\$/400 LF) ‡	Total Cost (\$/400 LF) ¶	Your Cost (\$/400 LF)	
	Hrs/ 400 LF	Cost/ 400 LF	Hrs/ 400 LF	Cost/ 400 LF	Hrs/ 400 LF	Cost/ 400 LF				
<i>Installation (Year 1):</i>										
Layout & Mark Site	3.0	40					98	138		
Trench (Backhoe or Trencher)					8	440		440		
Install Pipeline	5.0	67					4,270	4,337		
Fill In & Compact Site			8.0	167			77§	245		
<i>Subtotal</i>		107		167		440	4,445	5,160		
<i>Annual Operation &amp; Maint. (Years 2-5):</i>										
Uncover to Check, Berm & Re-Cover	8.0	107						107		
Channel/Check Water – Sandbags	1.00	13					8	21		
Clean Downspout Inlets					.5	28		28		
<i>Subtotal</i>		120				28	8	156		
<i>Interest on Operating Capital @ 7.4%</i>									32	
<i>Total Costs Per Unit – Year 1</i>							4,453	5,348		
<i>Total Costs Per Unit Per Year – Yrs 2-5</i>							8	156		
<i>Total Costs Per Linear Foot – Year 1</i>							11	13		
<i>Total Costs Per Linear Foot – Yrs 2-5</i>							0*	0*		

† Costs are per 400 linear feet.

‡ Detail of material costs located in Table 3. Representative Material Costs.

¶ May not sum due to rounding.

§ Fuel, lube and repairs.

\* \$0 = Cost is negligible when represented on a linear foot basis.



# Conservation Practices

## ⇒ Completed Studies ⇐

- *Grassed Farm Roads*
- *On-Farm Row Arrangement*
- *Non-Engineered Grassed Waterway*
- *Non-Engineered Water-Sediment Control Basin*
- *Underground Outlet*
- *Annually Planted Cover Crop*
- *Annually Planted Grassed Filter Strip*
- *Critical Area Planting*
- *Perennial Hedgerow Planting*





**Start out with small management changes,  
then build on successes.  
'one road at a time'**





## Furrow Alignment

**Consider 'softer',  
lower cost practices  
and management  
before investing in  
'structures'**





## Furrow Seeding



# Look for practices that have multiple benefits for farm management and productivity



**Sediment Detention and  
Tailwater recovery**



## Erosion Control Insectary Plantings



# Look beyond the fence line and work with surrounding neighbors



# Working with neighbors in a Watershed

\$2,800 Basin

\$1,700 Basin

\$2,660 Basin

\$3,100 Basin

Total Cost to  
farmers to  
eliminate  
problem:  
\$10,260



\$80,000 lawsuit  
to repair  
erosion damage  
with pipeline

# Sharing the Costs

Who should pay for conservation investments?  
Who should pay for external costs?

- the farmer?
- the landowner?
- a partnership between landowner and tenant?
- a local tax assessment district?
- all taxpayers?
- all of the above?



