

# Payments for Ecosystem Services and the Future of Land Management

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# New Forests Pty Ltd

- New Forests is an asset management and advisory services firm established in July 2005
- A specialized business focussed on creating value from environmental services, including carbon, water and biodiversity
- Company currently has fourteen staff, and offices located in Sydney, Washington, DC and San Francisco
- New Forests is a growing business and now provides services to a number of clients around the world

# What Does Land Represent?

- A bundle of services?
  - Productive capacity for timber, crops and domestic animals
  - Regulation of water quantity and quality
  - Regulation of carbon stocks and cycles
  - Biodiversity and its role in health, pollination, waste management, etc.

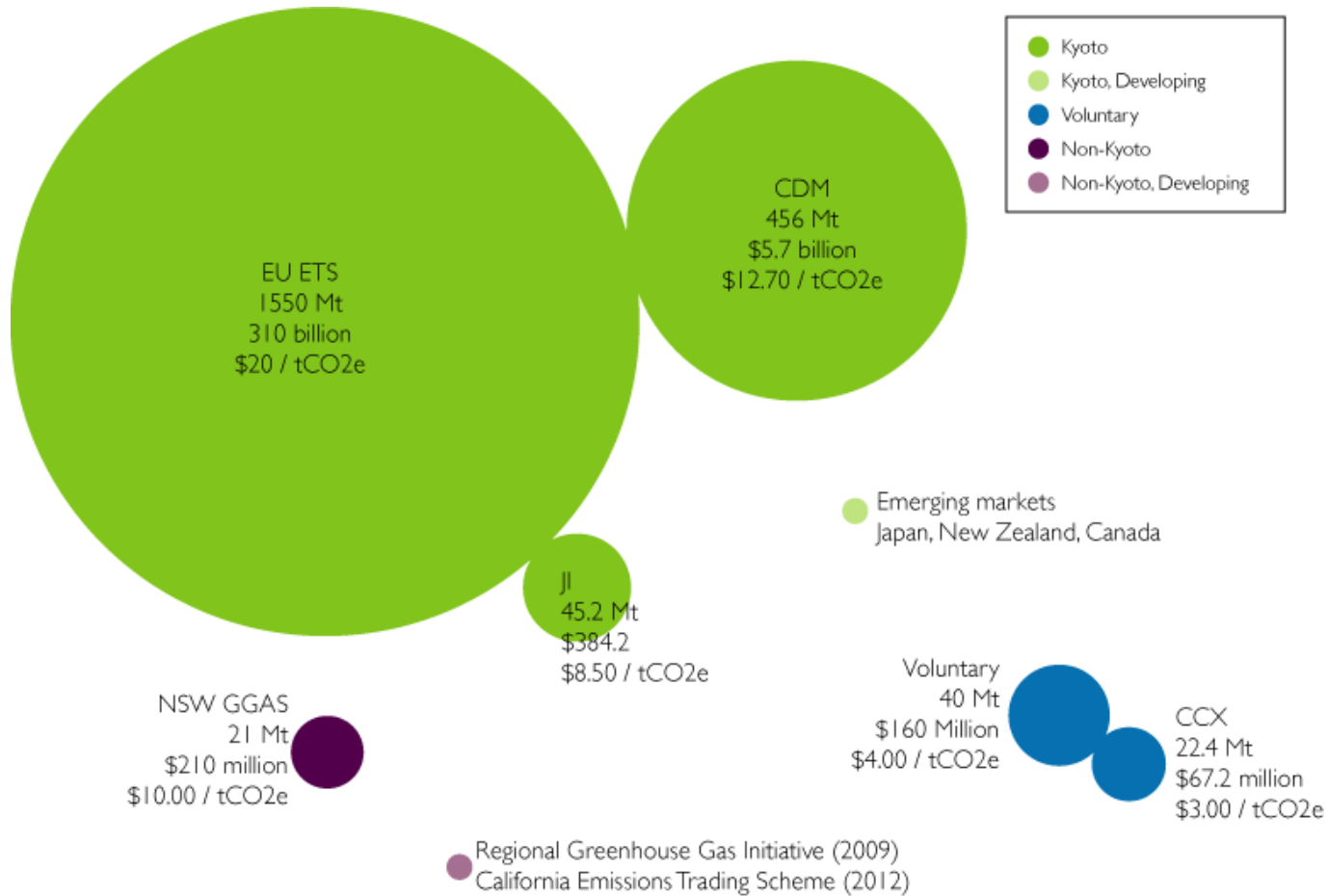
*The last three of these services are generally unpriced, and therefore we treat them wastefully or under-invest in their conservation*

*Even worse--environmental values are often even seen as liabilities—eg endangered species*

# Making sustainable land management a profit centre

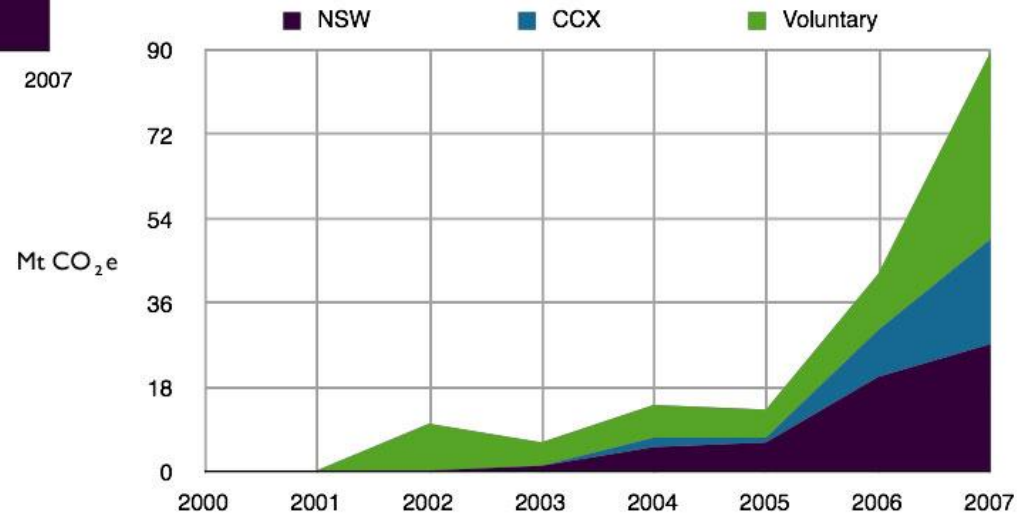
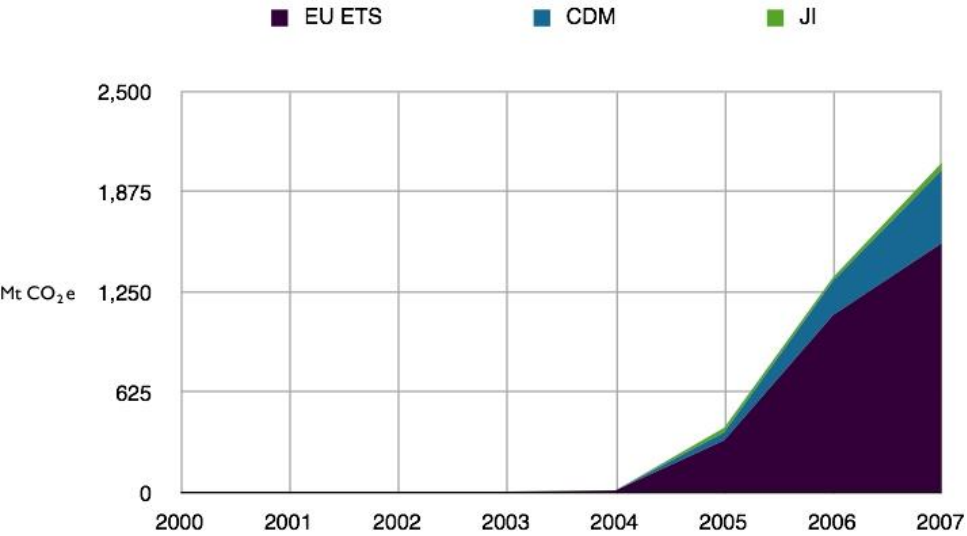
- Need to create market-based solutions to chronic environmental issues
  - Climate change
  - Land and Water Degradation
  - Loss of Biodiversity
- Examples are starting to emerge of a new approach to the environment—pricing of environmental and ecosystem values—shifting these to assets on the balance sheet

# Status of the Global Carbon Market in 2007

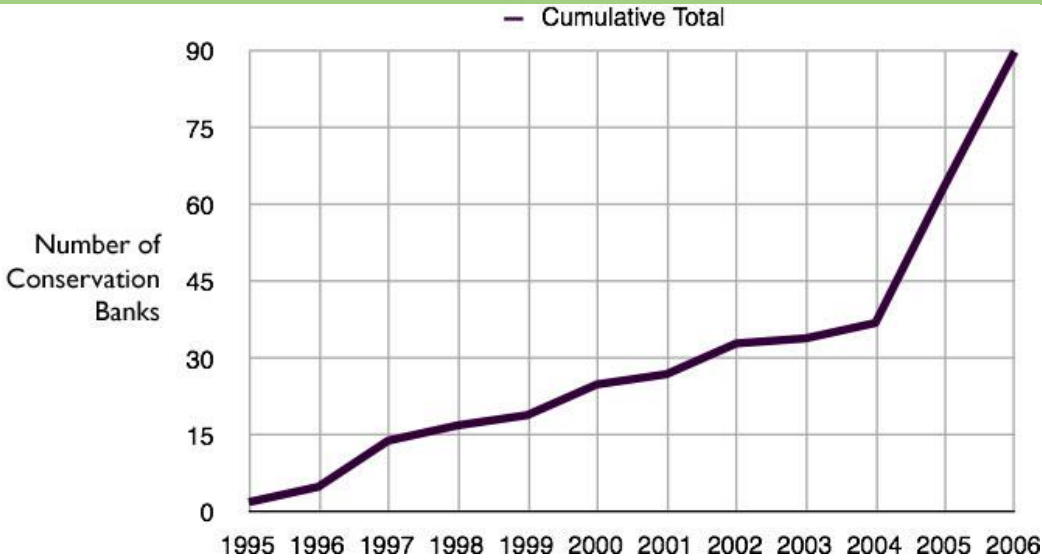


Sources: Carbon, Point Carbon, 2007. State and Trends of the Carbon Market 2007, World Bank, 2007. chicagoclimatex.com 2007.

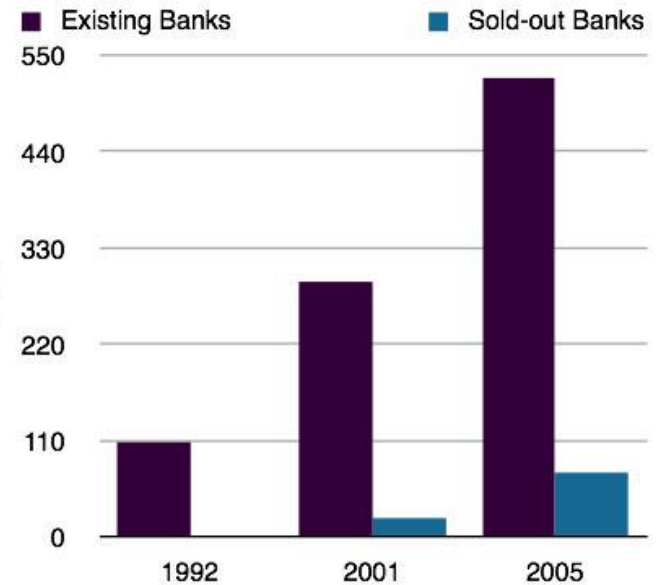
# Growth of carbon markets is rapid...



# Wetlands and Endangered species banks in the United States



Number of Wetland Mitigation Banks



# The Value of Water

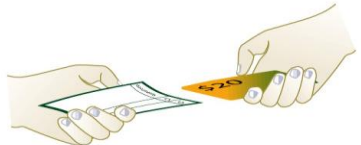
- Privatization of water rights is creating a substantial environmental asset
- This forces a rationalization of agribusiness
- Should facilitate productivity improvements (eg substitution of technology for water)
- Should also lead to new market actors and ancillary water quality markets

# Investment Fundamentals

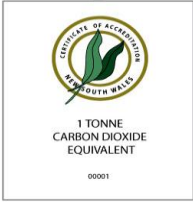
- Environmental investment has been largely left to the public account
- With eco-markets there is rapidly rising investor interest in emerging opportunities—eg \$14 billion now invested in carbon markets
- Long-term institutional investment is critical to creating sustainable landscapes, but poor cash flow and low returns have prevented investment in environmental assets—this is now changing fast

# Carbon Rights as an Example

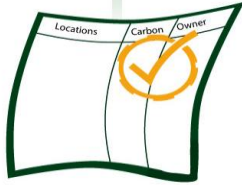
REGISTRY UPDATE AND  
EXTINGUISHMENT OF CREDITS



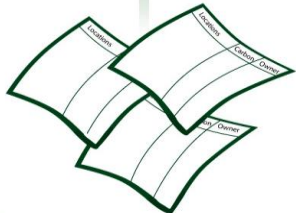
REGISTRATION AND  
CERTIFICATION



VERIFICATION PROCEDURE



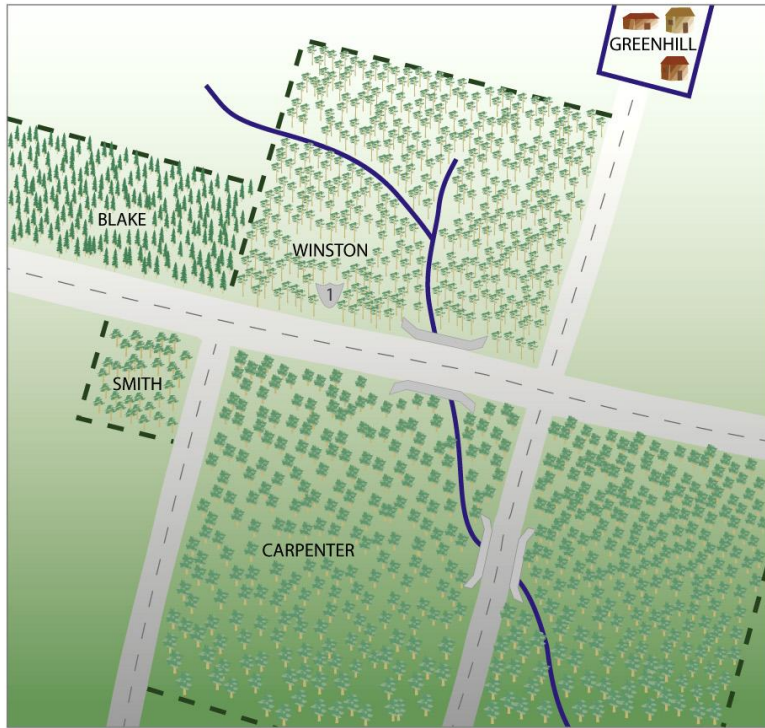
MEASUREMENT AND  
ACCOUNTING STANDARDS



LEGAL DEFINITION AND RIGHTS



Carbon sequestration right  
Forestry right  
Land ownership



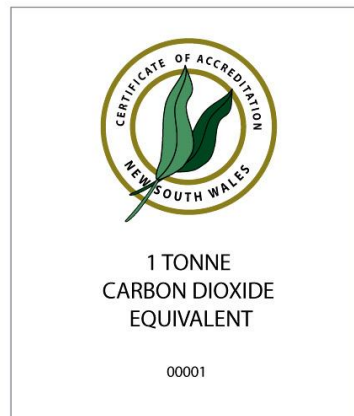
**CARBON POOL, LTD - STATEMENT OF CARBON ACCOUNTS**

Property	Area (acres)	Year Planted	Species	Crop type Simulation	Carbon Stock 2008 T CO2	Carbon Stock 2012 T CO2	Carbon Stock Change
Smith	304	1998	Red Oak	50 year rotation	12,700	22,700	10,000
Blake	612	1998	Loblolly Pine	35 year rotation	24,000	60,000	36,000
Winston	1,254	1999	Oak-Hickory	Selection harvest after 30 years	50,000	110,000	60,000
Carpenter	3,067	1999	Aspen	20 year rotation	125,000	300,000	175,000
<b>TOTAL</b>	<b>5,237</b>						<b>281,000</b>

CARBON RIGHTS

VERIFICATION AND CERTIFICATION

ISSUANCE OF CERTIFICATES



US GOVERNMENT REGISTRY

Vintage Years	Pool Mgr/Issuer	Serial Number	Owner	Status
2008-2012	Carbon Pool Ltd	0001	PowerCo	Ext.
2008-2012	Carbon Pool Ltd	0002	PowerCo	Ext.
2008-2012	Carbon Pool Ltd	0003	PowerCo	Ext.
2008-2012	Carbon Pool Ltd	0004	Electrico	Active
2008-2012	Carbon Pool Ltd	0005	Electrico	Active
"	"	"	"	"
"	"	"	"	"
"	"	"	"	"
"	"	"	"	"

# TACKLING THE CHALLENGE OF DRYLAND SALINITY

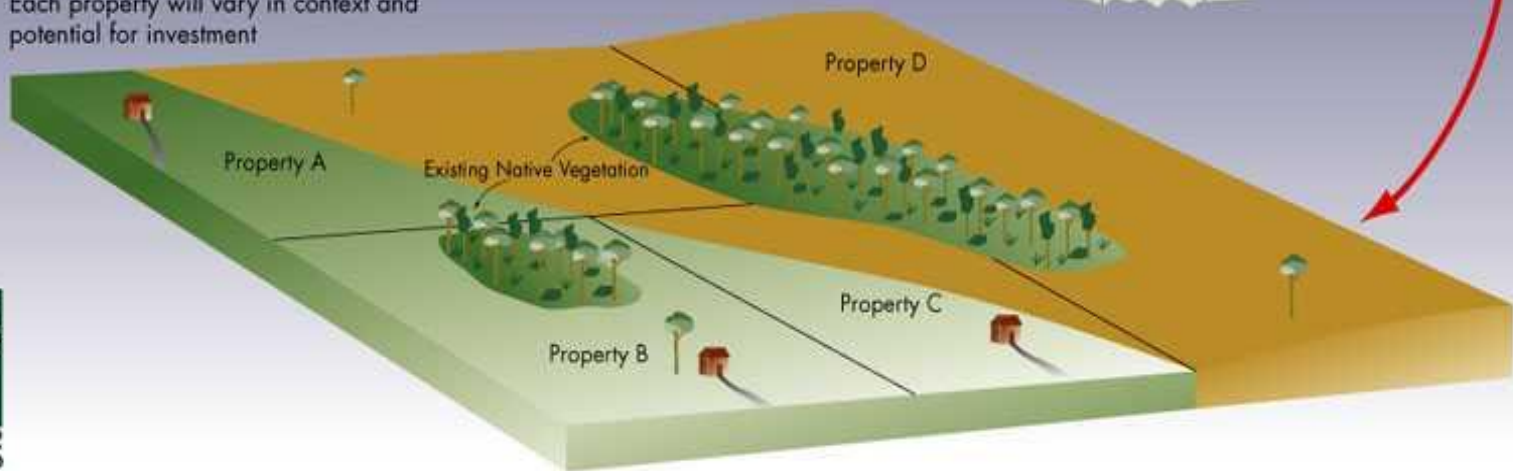
Key regions of dryland salinity



Key recharge zones are identified in each region and linked to potential markets

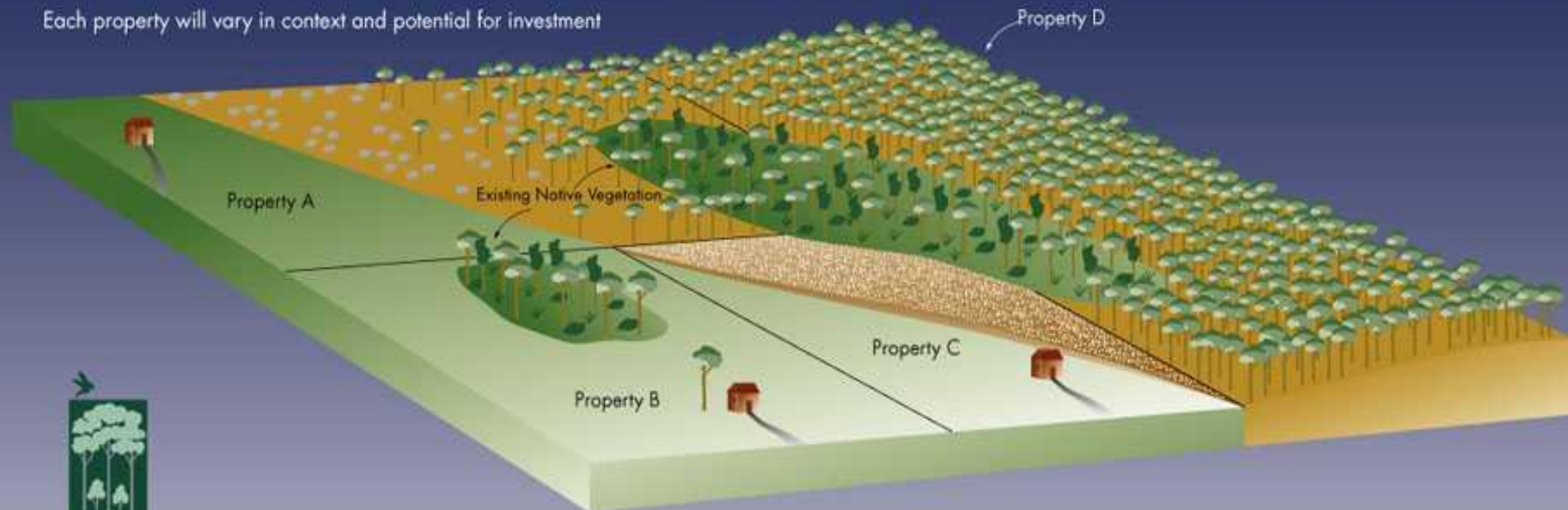


Each property will vary in context and potential for investment



# ENVIRONMENTAL INVESTMENT AT THE PROPERTY LEVEL

Each property will vary in context and potential for investment



OWNER	CURRENT PRACTICE	PROPOSAL	NET IMPACT
A	Crops/Sheep	Plant 50% of grazing land to trees	- Net increase in property income through annuities
B	Crops	Maintain land use	- Benefits from reduced salinity risk
C	Crops/Sheep	Establish 30% perennial pasture	- Some increase in income from salinity credit payment
D	Sheep	Sell property and have reforested	- Land is retired from agriculture. Revenue from environmental services and energy products covers land rent

## REVENUE

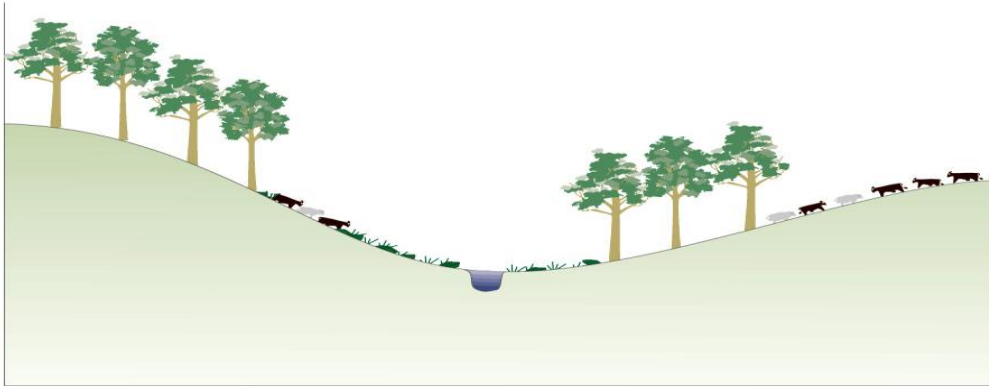
Cropping \$120/ha/yr

Sheep \$30/ha/yr

Forestry annuity payment \$80/ha/yr

Salinity credits \$30/ha/yr

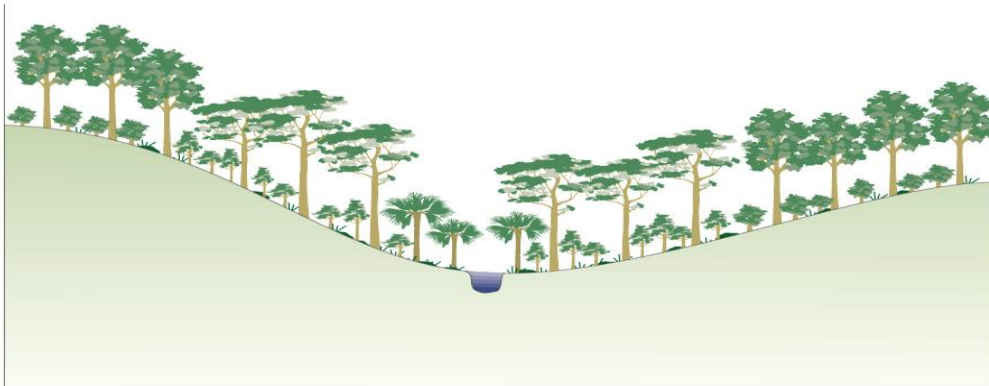
### GRAZING PROPERTY



### BIODIVERSITY ACCOUNTS

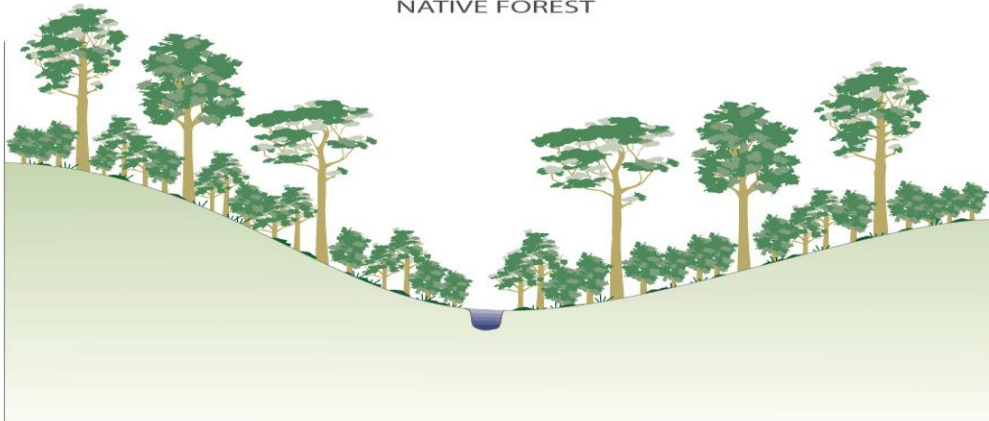
	PLANTS	TREES	BIRDS	MAMMALS
NATIVE	13	3	6	5
EXOTIC	7	1	5	5

### NATIVE SPECIES PLANTATION



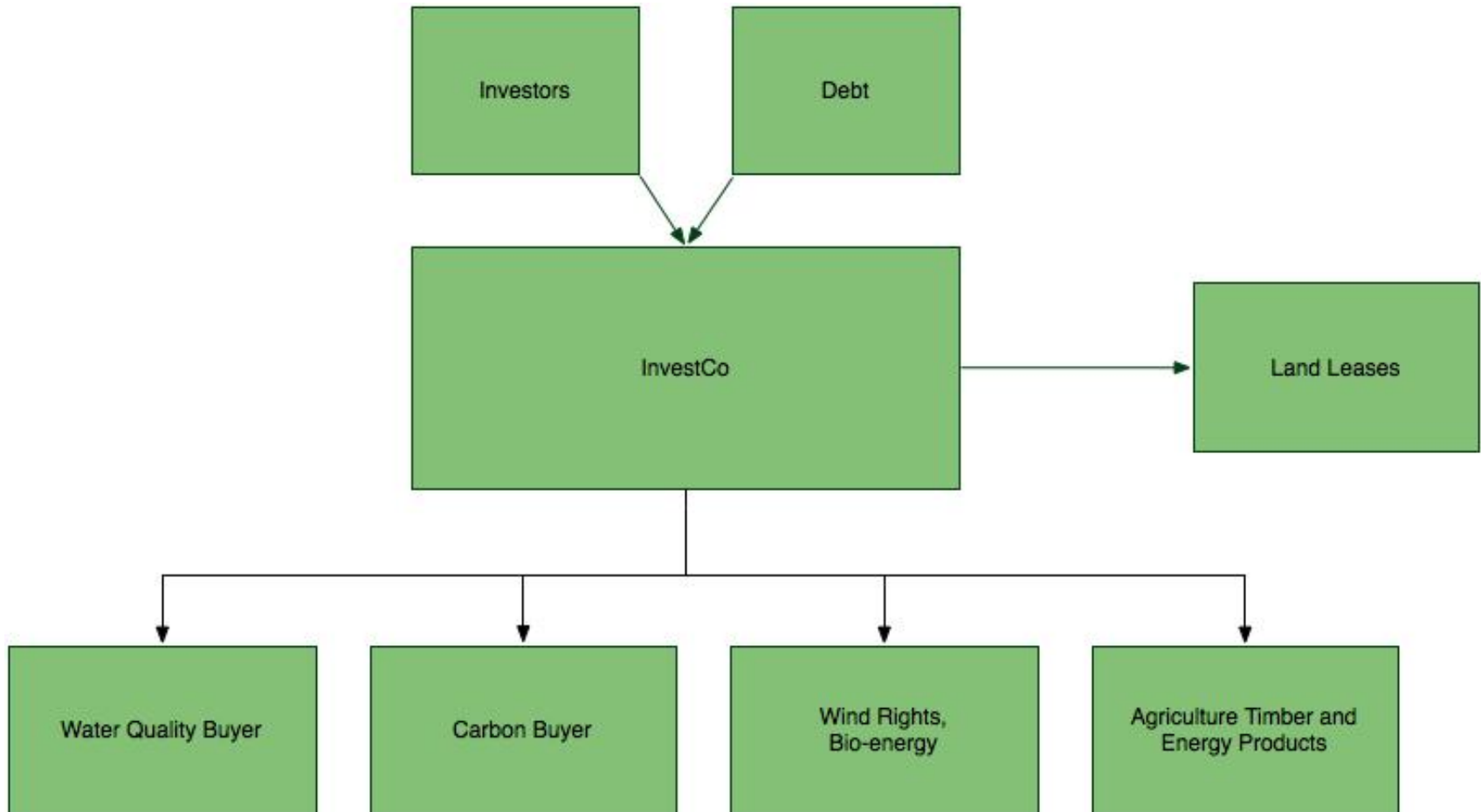
	PLANTS	TREES	BIRDS	MAMMALS
NATIVE	74	14	24	17
EXOTIC	3	0	2	2

### NATIVE FOREST



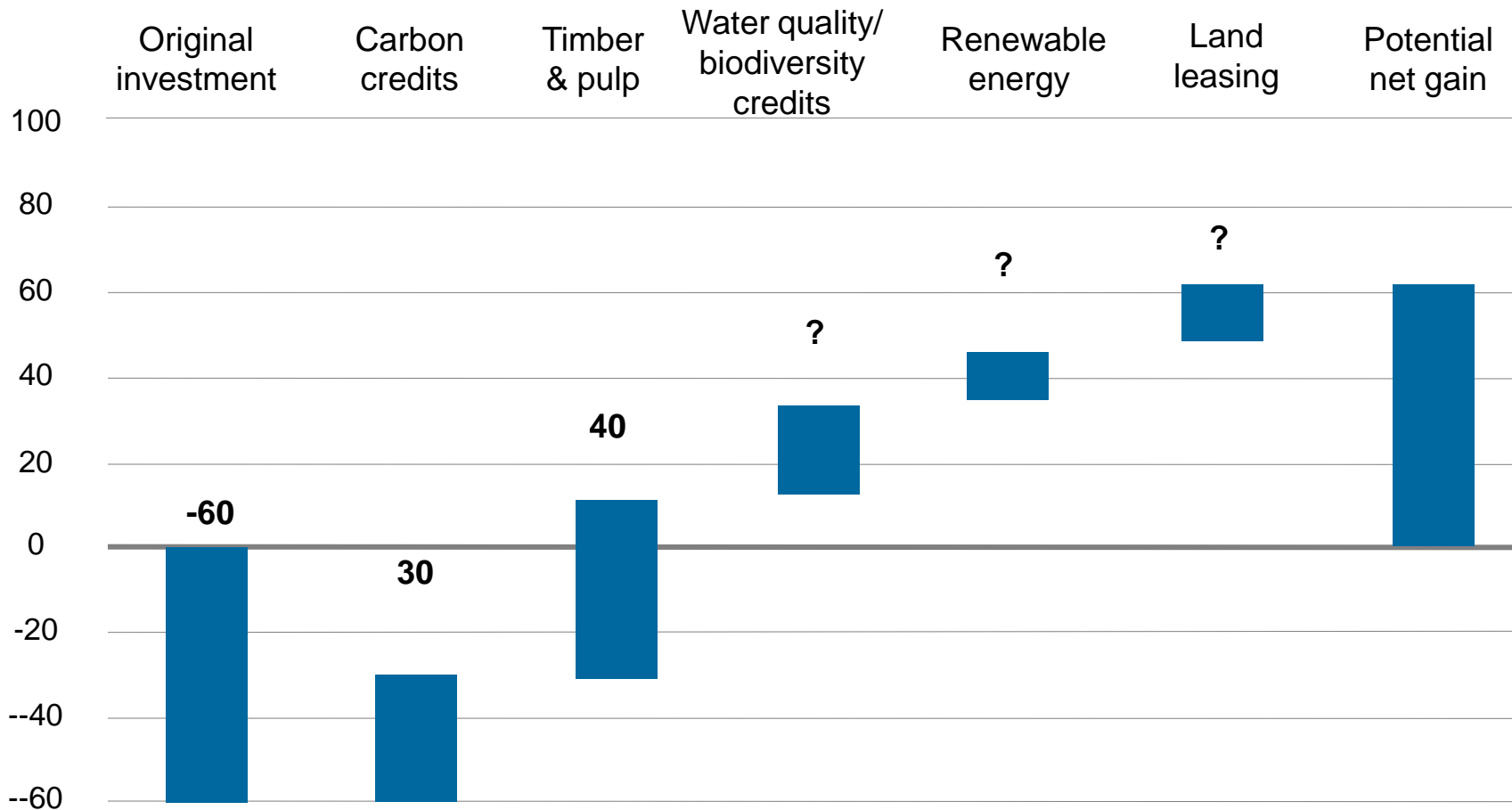
	PLANTS	TREES	BIRDS	MAMMALS
NATIVE	165	21	26	31
EXOTIC	3	0	2	3

# Generalized investment Model



# Capitalizing environmental externalities in land management

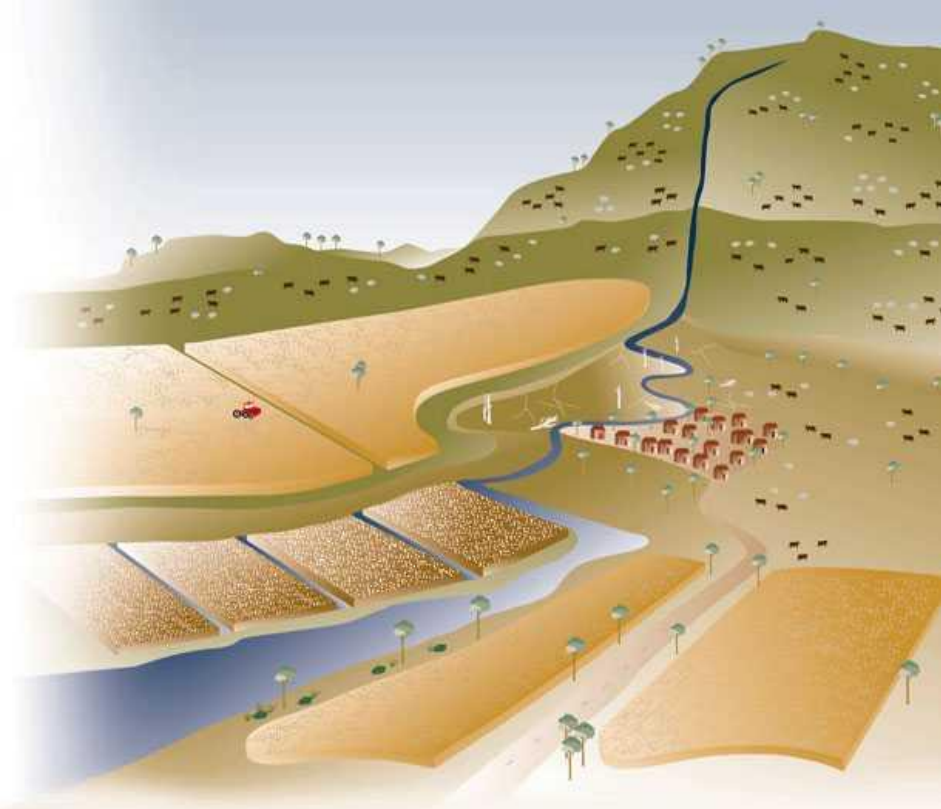
Figures in million\$ (Assume NPV based on 9% real discount rate)



# Example—Tarrangower

- 8,500 hectare property in New South Wales
- Largely used for cattle grazing
- 50% of area will be reforested for native timber production, 50% for conservation of biodiversity
- \$9 million purchase price. Timber return about 4% real IRR, plus 3% real IRR for carbon sequestration credits, plus 105 MI of water rights, plus ridgetop potential for windfarm
- Reforestation project was rated by local Catchment Management Authority to have high biodiversity benefits— led to \$1 million grant

*At least half of the returns from this investment come from environmental revenue streams*



## P R E S E N T

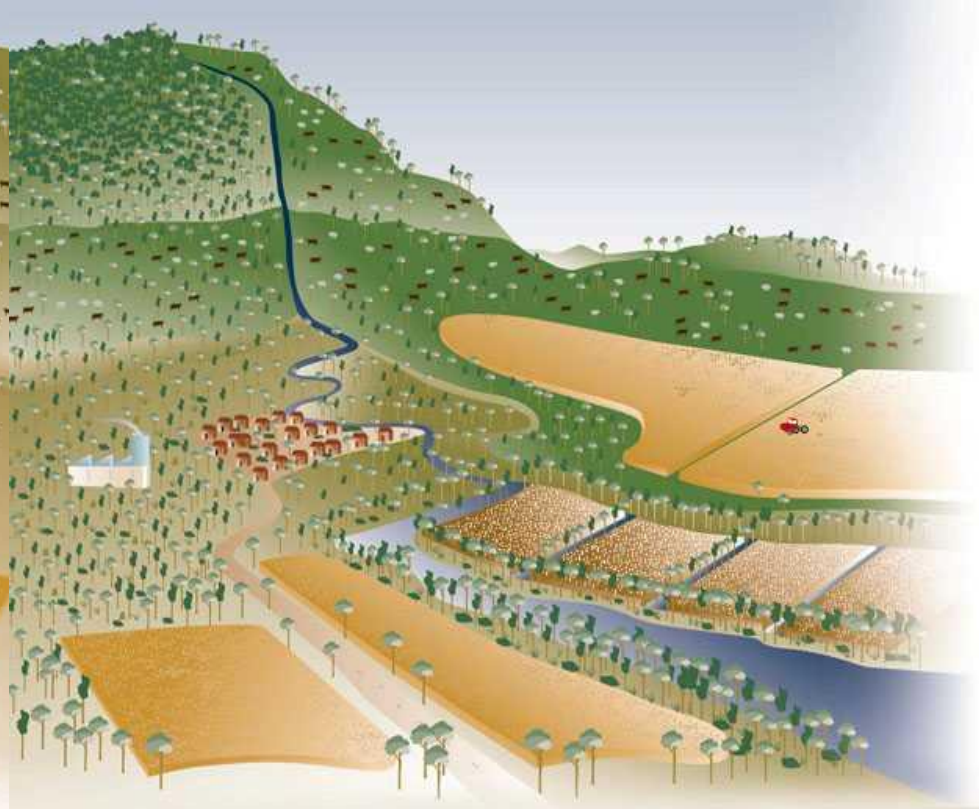
*The existing rural landscape.*

### LAND USE

OUTPUT	AREA (ha)	REVENUE (000's)
Sheep	200,000	40,000
Cattle	250,000	118,000
Wheat	150,000	112,000
Canola	150,000	490,000
Cotton	150,000	490,000
<b>TOTAL</b>	<b>1,000,000</b>	<b>785,000</b>

### ENVIRONMENTAL PROBLEMS

- ◆ Dryland salinity increasing
- ◆ Rising water tables and saline discharge
- ◆ Nutrients leaching into waterways
- ◆ Low biodiversity
- ◆ Soil erosion and turbid waterways



## F U T U R E

*Planted forests in the landscape create a more diverse economy and a healthier environment.*

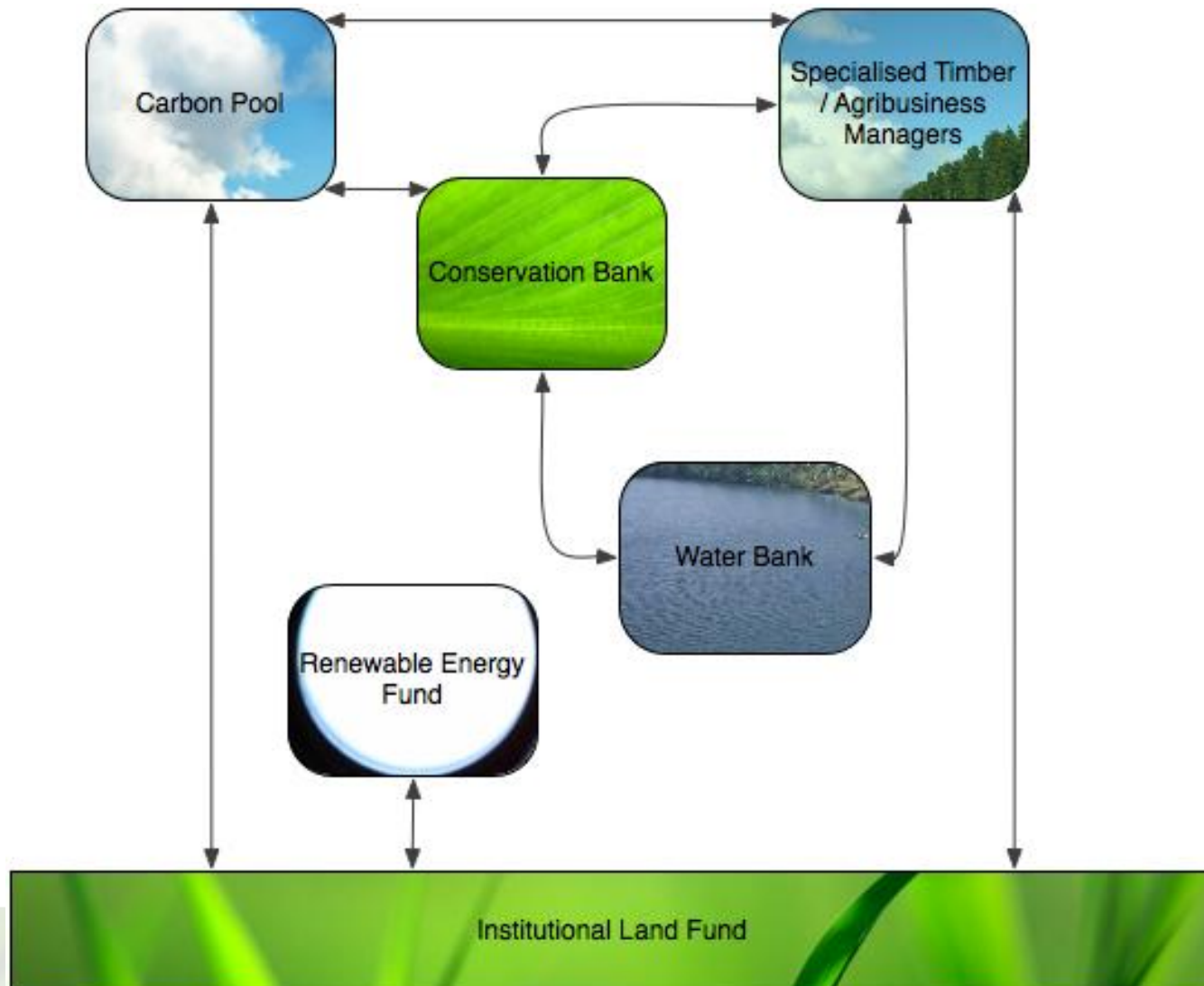
### LAND USE

OUTPUT	AREA (ha)	REVENUE (000's)
Sheep	150,000	18,000
Cattle	120,000	28,000
Wheat	200,000	94,000
Canola	120,000	90,000
Cotton	150,000	490,000
Timber	26,000	12,000
Bioenergy	117,000	9,000
Charcoal	117,000	14,000
Carbon credits		41,000
Salinity credits		26,000
<b>TOTAL</b>	<b>1,000,000</b>	<b>822,000</b>

### ENVIRONMENTAL BENEFITS

- ◆ Dryland salinity reduced
- ◆ Lower water tables and clean discharge
- ◆ Nutrients retained on farm
- ◆ Biodiversity increased
- ◆ Soil erosion reduced

# These programs starting to create shifts in land management entities



# Conclusion

- Commercial value drives investment and current lack of value for the environment leads to under-investment in sustainable land management
- New investment models are emerging that make the environment a profit centre, and which will shift the commercial basis of land management

*The competitive advantage of nations emerges from addressing their own unique challenges and then exporting the solutions...*

*Michael Porter*



# NewForests

*Asset Management • Advisory • Ecological Products*