
NewForests
Conservation Assets:
Forest Carbon &
Mitigation Banking
New Forests Sector Overview

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Information current as of September 15,2014.

Investment in Conservation Assets

- Markets have emerged to monetise environmental attributes – e.g. carbon credits, wetland mitigation banking credits, nutrient pollution credits, and biodiversity conservation certificates.
- The management model is to embed environmental conservation actions into land development or production activities to achieve “no net loss” or “no net harm” outcomes.
- Forestry investment in the United States has now evolved beyond traditional timber management to also encompass returns driven by conservation management strategies and the valuation of ecosystem services.
- New Forests’ US business focuses on strategies related to conservation forestry, mitigation banking, and forest carbon.
- We established the first institutional fund investing in both forest carbon and mitigation banking and have developed additional investment products that build on our track record.


Mitigation
Banking

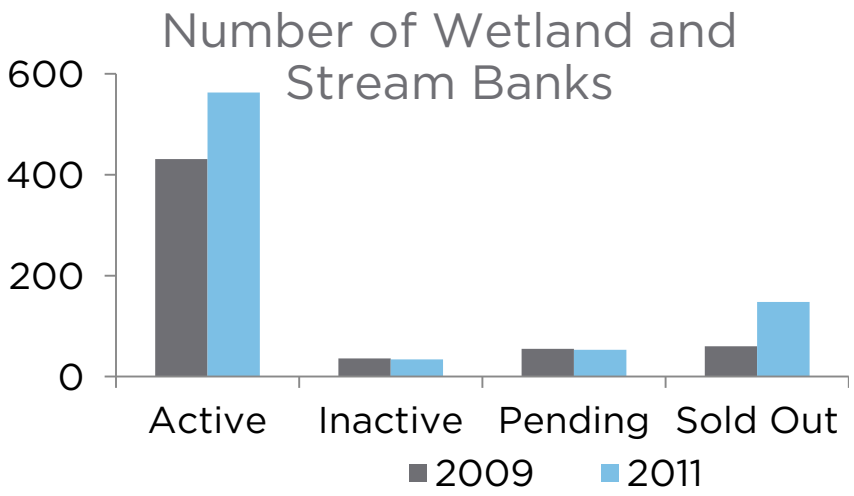
What Is Mitigation Banking?

Mitigation banking involves the creation and sale of credits for wetland, stream, or endangered species habitat conservation, restoration, or protection.

- The purpose of mitigation banking is to provide compensation for unavoidable impacts to aquatic resources permitted under Section 404 of the Clean Water Act (CWA) or a similar state or local wetland regulation. Conservation banks or species banks operate in a similar manner but focus on rare and endangered species habitat.
- Mitigation banks are a type of real asset as the value is being derived from the land and is linked to activities in other real asset sectors, such as:
  - **Real estate** – mitigation banking credits are sold to developers of residential and commercial real estate
  - **Infrastructure** – mitigation banking credits are sold to large infrastructure projects, particularly transportation, reservoirs, flood control projects, etc.
  - **Energy** – mitigation banking credits are sold to oil wells, pipeline developers, solar projects, etc.

Balancing Development with Environment

- The federal Clean Water Act and Endangered Species Act are driven by principles of "no net loss" of wetlands and streams and by a zero harm approach to endangered species habitat. Proponents of large land development projects must compensate for impacts they make to these areas, often times at a multiple, and before they get their grading permit.
- The mitigation banking industry has developed as a means of compliance with federal law, designed to create commercial and economic value for wetlands, streams, and endangered species habitat.
- A mitigation banker is responsible for establishing a mitigation bank (e.g. a reconstructed wetland) that sells credits to private land developers, public agencies (e.g. Department of Transportation), organisations, or individuals with mitigation needs.
- This creates a market in which there is supply and demand for restoring and protecting ecologically sensitive areas.



Some ecosystem services provided by wetlands and streams:

- Nutrient regulation
- Soil and sediment regulation
- Natural hazard regulation
- Cultural values and aesthetics
- Water supply
- Food production
- Wildlife habitat
- Recreation

Source: http://www.speciesbanking.com/pages/us_wetland_stream_banks.

Mitigation Banking in Practice

Development impacts (e.g. construction of gas pipelines; reservoir construction and expansion; highway construction; solar and wind farm developments and their transmission corridors; commercial real estate) drive demand for mitigation. Mitigation banks undertake environmental restoration work and sell credits within a determined service area to compensate impacts in accordance with permitting requirements.

Development Impact

Service Area

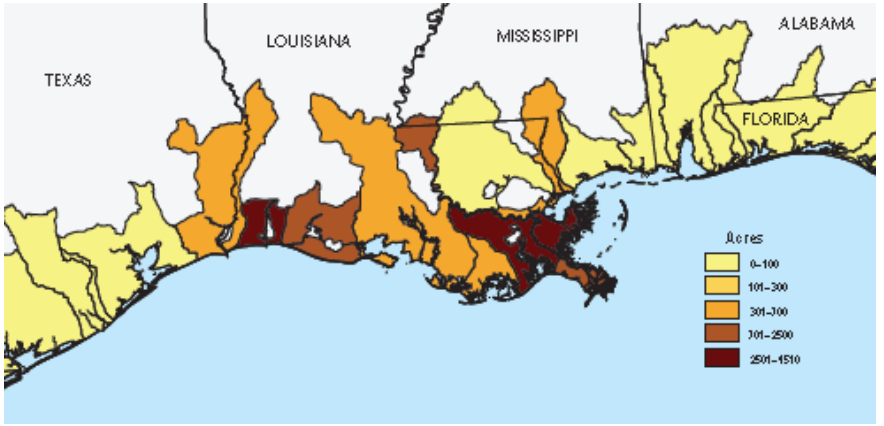
Mitigation Bank

Ecosystems Are Vital to US Economy

The destruction of wetlands, streams and endangered species habitat leads to economic and environmental losses.

- Coastal wetlands provide nurseries, shelter and food for fish and marine mammals as well as resting, feeding and breeding habitat for 75% of US waterfowl and migratory birds. Half of all of endangered species depend on them to live.
- Wetlands also benefit people by improving water quality (through filtering runoff) and protecting coasts from erosion and flooding.
- Coastal regions provide numerous recreational opportunities as well. The level of economic activity generated in all coastal counties in the US is over $6.6 trillion, which was just under half of the country's gross domestic product in 2011.

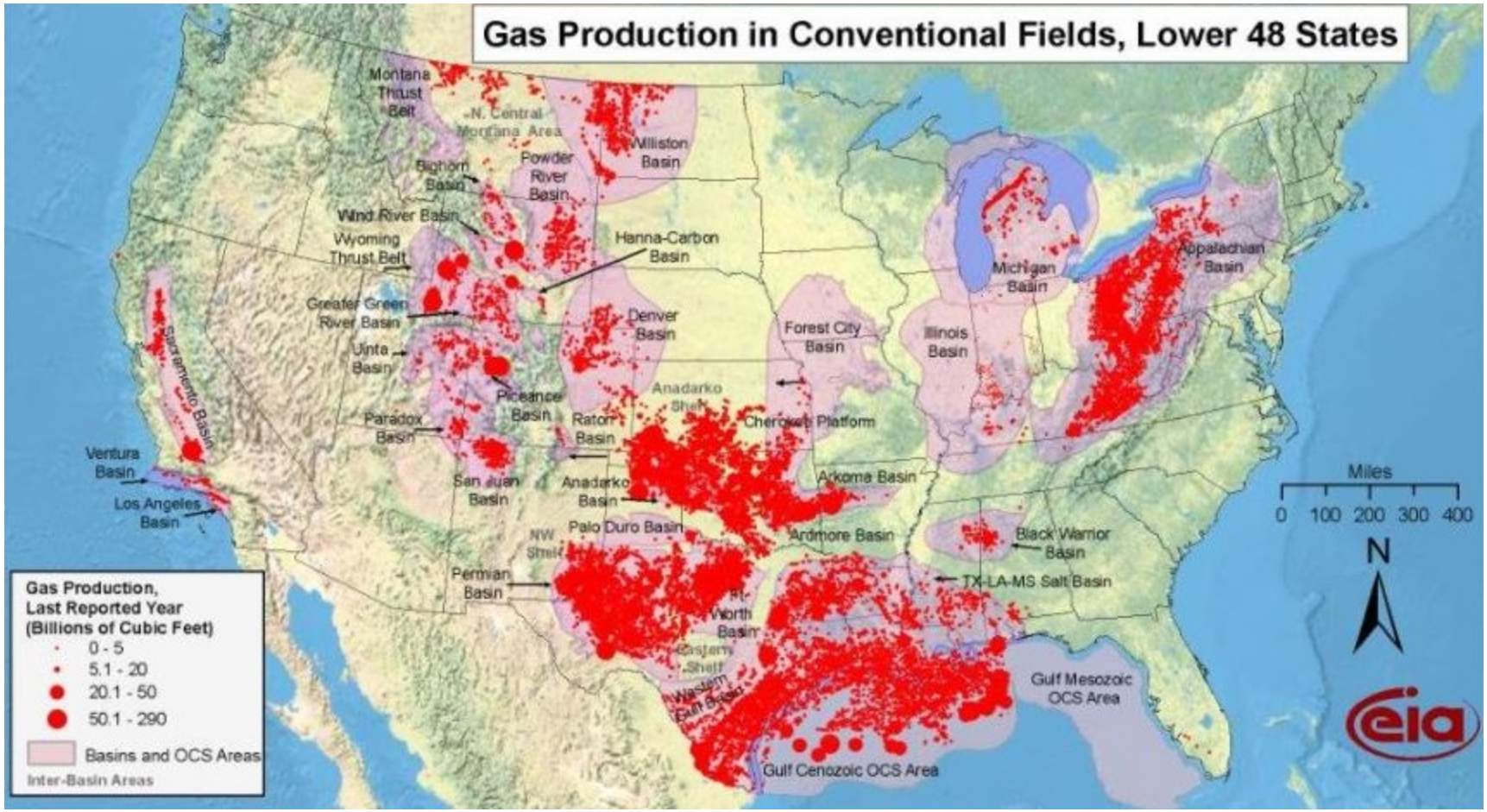
Magnitude of Wetland Loss in the Gulf States Region (2004 – 2009)



Source: http://www.fws.gov/wetlands/Documents/Status-and-Trends-of-Wetlands-In-the-Coastal-Watersheds-of-the-Conterminous-US-2004-to-2009.pdf.

Oil and Gas Production Requires Mitigation

One of the main drivers for mitigation credits in the Gulf Coast region is oil and gas production – mitigation credits are needed for wells and drill pads.

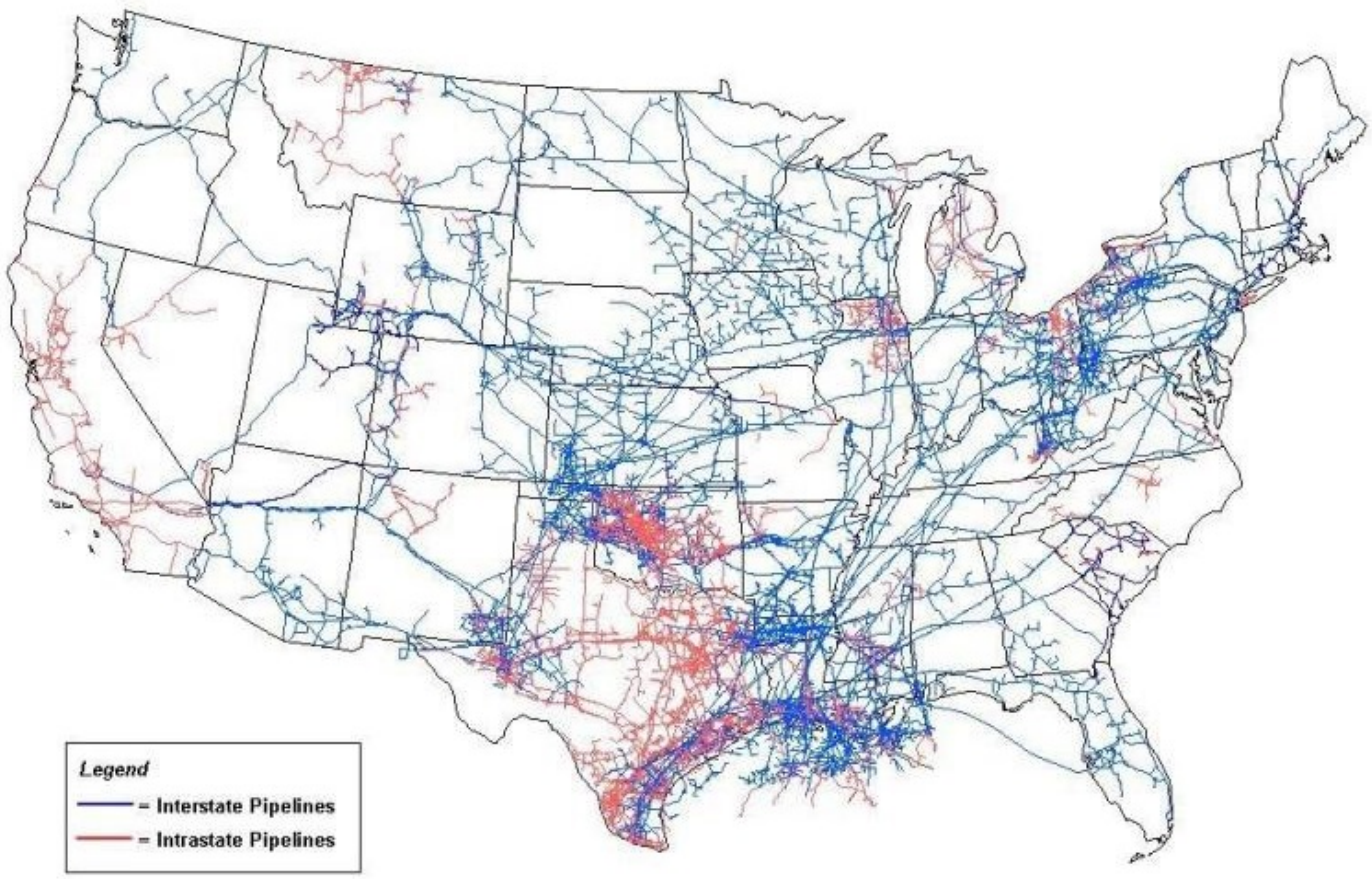


Source: Energy Information Administration based on data from HPDI, IN Geological Survey, USGS. Updated April 8, 2009.

New Pipelines Often Require Mitigation

Mitigation is needed for the many miles of pipelines that are built to transfer oil and gas to refineries.

Long, linear projects like pipelines may cross many streams and wetlands.



Source: Energy Information Administration, Office of Oil & Gas Division, Gas Transportation Information Systems

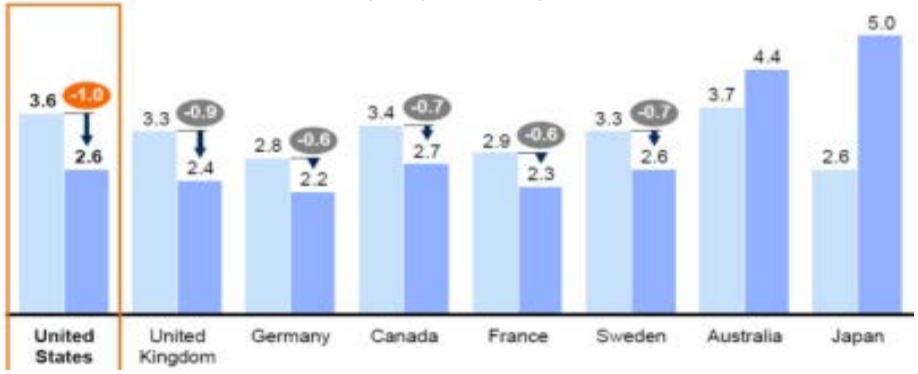
Clear Demand for Infrastructure Investment

Large infrastructure projects impact wetlands, streams, and endangered species habitats and may exacerbate water-quality problems.

- Nationwide, $48.6 billion was spent on infrastructure in 2013 across more than 15,000 projects. The estimated investment gap needed by 2020 is $3.6 trillion.
- McKinsey estimates the US must raise infrastructure spending by 1% of GDP.
- The South has been the leading area of population growth in the US, driven in part by its economic growth outpacing the rest of the country. Population grew 1% in 2013, compared to 0.7% for the rest of the US. The area now constitutes by far the largest economic region in the country.
- Growth will create increased demand for investment in real estate development, basic infrastructure, transportation, and highway development.

Infrastructure Spending Gap

(% of GDP, based on projected growth 2013-30)*



Actual Investment by Sector

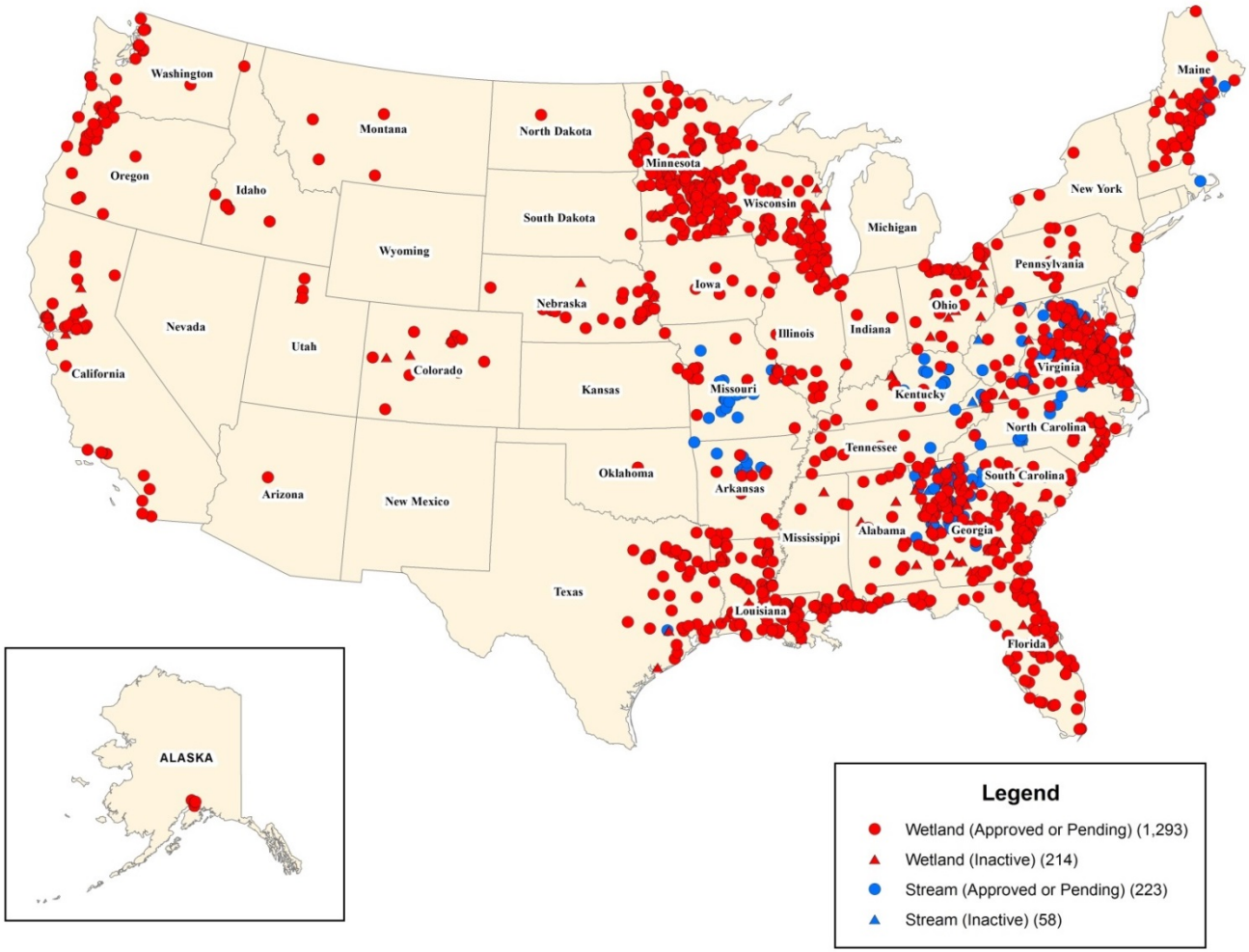
(2013)**

Sector	Spend (USD)
Highway	$27.6bn
Rail	$10.8bn
Transit	$8.8bn
Aviation	$1.2bn
Maritime	$0.23bn

Sources: http://www.infrastructurereportcard.org, US Census Bureau, * McKinsey Global Institute Analysis, ** US DOT.

Distribution of Wetland and Stream Banks

Areas with more wetlands and streams coincide with more demand for mitigation banks; local regulatory jurisdictions may favor banks over other forms of mitigation.



Data source for map: RIBITS, 2014.

Mitigation Banking Market Overview

Market Size	• Total market for compensation from sales of mitigation credits and other sources of compensation is approximately $2.0 billion to $3.4 billion annually*
Regulatory Oversight	• US Army Corps of Engineers, US Fish and Wildlife Service, and other federal and state government agencies
Number of Banks	• Currently 1,605 active and pending mitigation banks in aggregate**
Market Growth	• Growth averages 15% annually over past three years*
Credit Pricing	• Wetland credits typically sell at $15,000 to $80,000 per acre* • Stream credits typically sell at $200 to $350 per linear foot* • Credits may sell for over $300,000 per acre for rare habitat* • Pricing highly localized based on supply/demand in the service area
Environmental Benefits	• Around 633,000 acres** have been permanently preserved through mitigation banking, with roughly 22,000 acres per year committed to wetlands and stream mitigation banks.* Land use is conservation based and delivers positive environmental outcomes

**US Army Corps of Engineers operates in district-based units of authority, and national mitigation banking data is provided via database, RIBITS. "Other" mitigation banks include sold out, terminated, and withdrawn banks. (RIBITS, January 2014)

	Active	Pending	Other	Total
Wetland	1,124	169	214	1,507
Stream	176	47	58	281
Species	77	12	14	103
Total	1,377	228	286	1,891

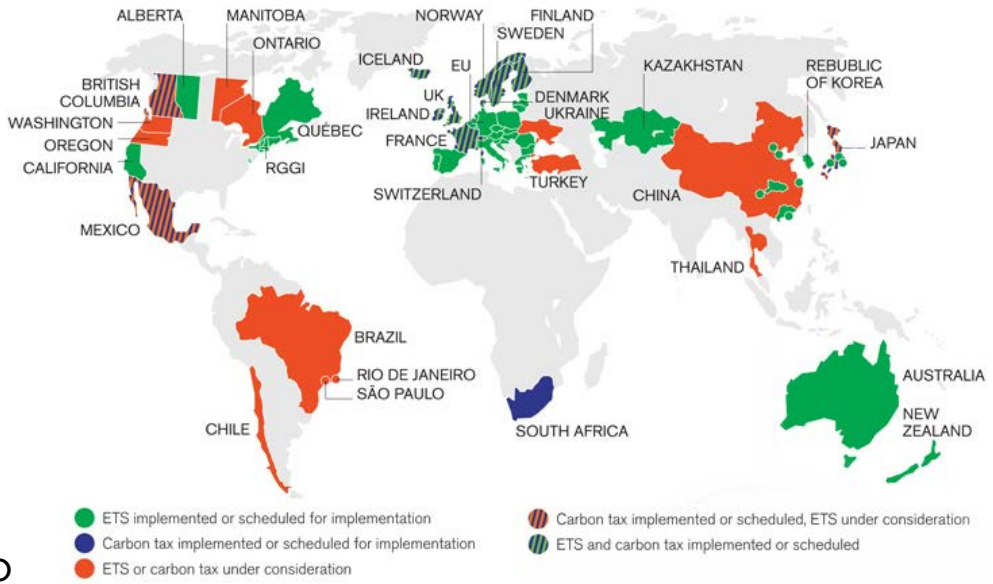
*Source: Ecosystem Marketplace, State of the Biodiversity Markets – 2011 Update


Forest Carbon

Overview of Carbon Markets

The world's emissions trading schemes are now valued at about USD 30 billion. Globally, there are now approximately 40 countries and 20 states, regions, or cities that have implemented or are scheduled to implement carbon pricing mechanisms.

- Both mandatory (regulated) and voluntary carbon markets exist.
  - Regulated: e.g., European Union, California, New Zealand, and US Northeast
  - Unregulated: Organisations choose voluntarily to offset their carbon emissions
- Regulated cap-and-trade systems place a limit on total greenhouse gas pollution by issuing or auctioning a limited number of tradable permits to pollute. Some cap-and-trade systems allow emission reduction projects from unregulated sectors of the economy to sell offsets to companies in regulated sectors.



New Forests focuses on the California carbon market due to the market's scale and sophistication.

Source: 'State and Trends of Carbon Pricing' report. May 2014. Note Australia's carbon pricing scheme has been repealed by the Senate as of July 2014.

California Carbon Market

California is the world's first regulated carbon market to include offsets from carbon storage in forests.

- Forests play a significant role in global climate and the carbon cycle. A carbon price signal can add commercial value to certain standing and growing forests.
- The California cap-and-trade market allows emitters to use offsets to cover up to 8% of their compliance obligation for carbon pollution.
- Analysts expect offset demand of 150-200 million tonnes in aggregate by 2020, with an expected market value of over USD 2 billion.
- Forest offsets are one of a few types of allowed offsets. At present the market is supply-constrained.

California Forest Project Types

California allows forestry activities that reduce or avoid greenhouse gas emissions to generate offsets for use in the carbon market.

- Improved Forest Management (IFM) – where more carbon is stored through management strategies that sequester additional carbon over time compared to business as usual management
- Avoided Conversion – where a conservation easement avoids the conversion of a forest to non-forest use
- Reforestation – where new planting projects store carbon in growing forests

Integrity of Offset Supply and the System

Forest carbon offset projects must meet strict environmental, social, and technical criteria to comply with state regulations.

The state's regulator, the Air Resources Board, can issue Offset Credits (ARBOCs) to projects that have received a positive verification from qualified third-party verifiers.

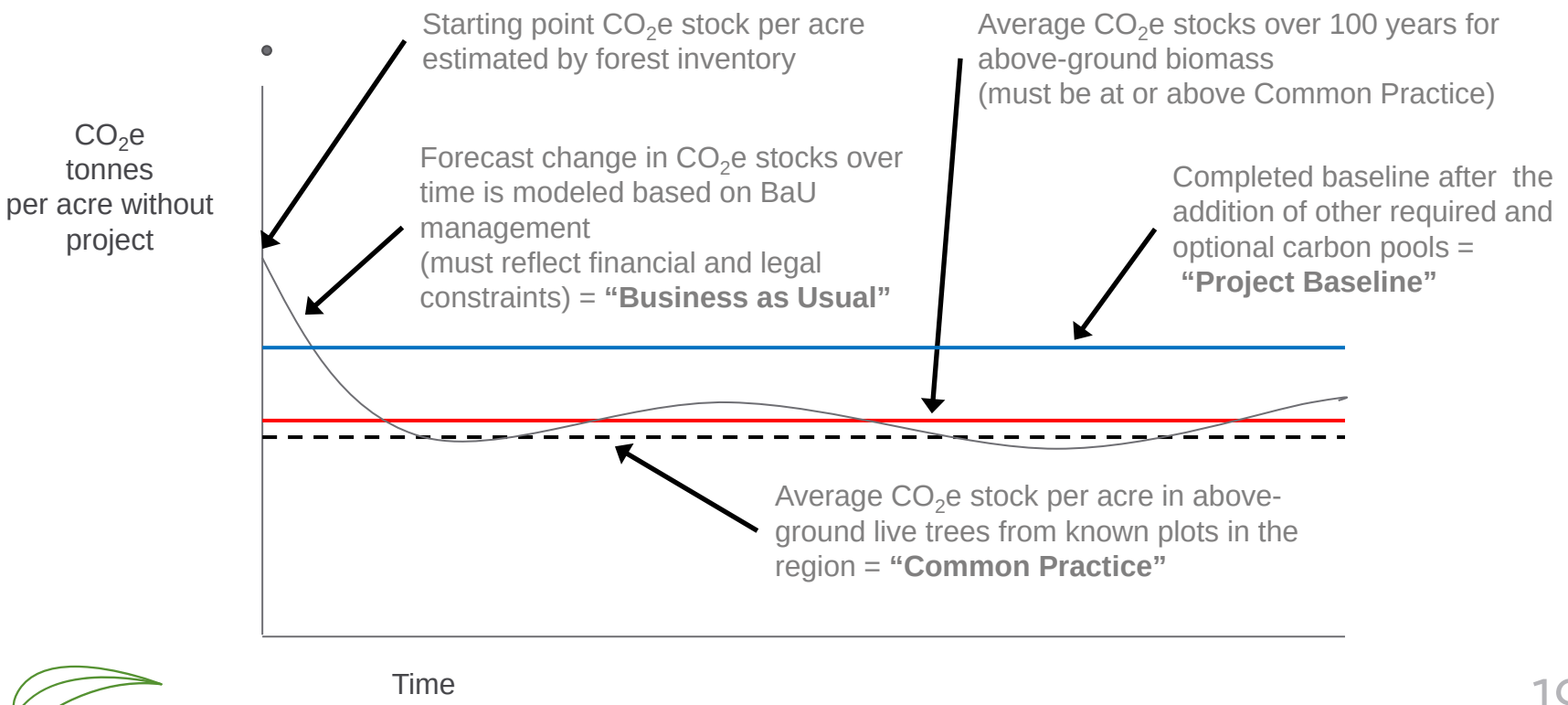
New Forests successfully registered the first forest carbon project under the state's Compliance Offset Protocol - US Forest Projects in 2014 for the Yurok Tribe. The registration of the Yurok Project demonstrates that the rigorous California compliance offset protocol can deliver real financial and environmental benefits to forest landowners in the United States.

Click the image above to learn about forest carbon verification and The Yurok Tribe/Forest Carbon Partners CKGG Improved Forest Management Project. Video will launch on YouTube.

How IFM Projects Quantify Carbon

- Forests store carbon in several reserves – known as carbon pools – such their above-ground biomass, below-ground biomass, fallen trees and branches, and the soil.
- Carbon projects quantify the difference in total carbon stored in some pools in a "project scenario" as compared with business as usual, which must reflect the financial and legal constraints of a managed forest.

Quantifying the Project Baseline

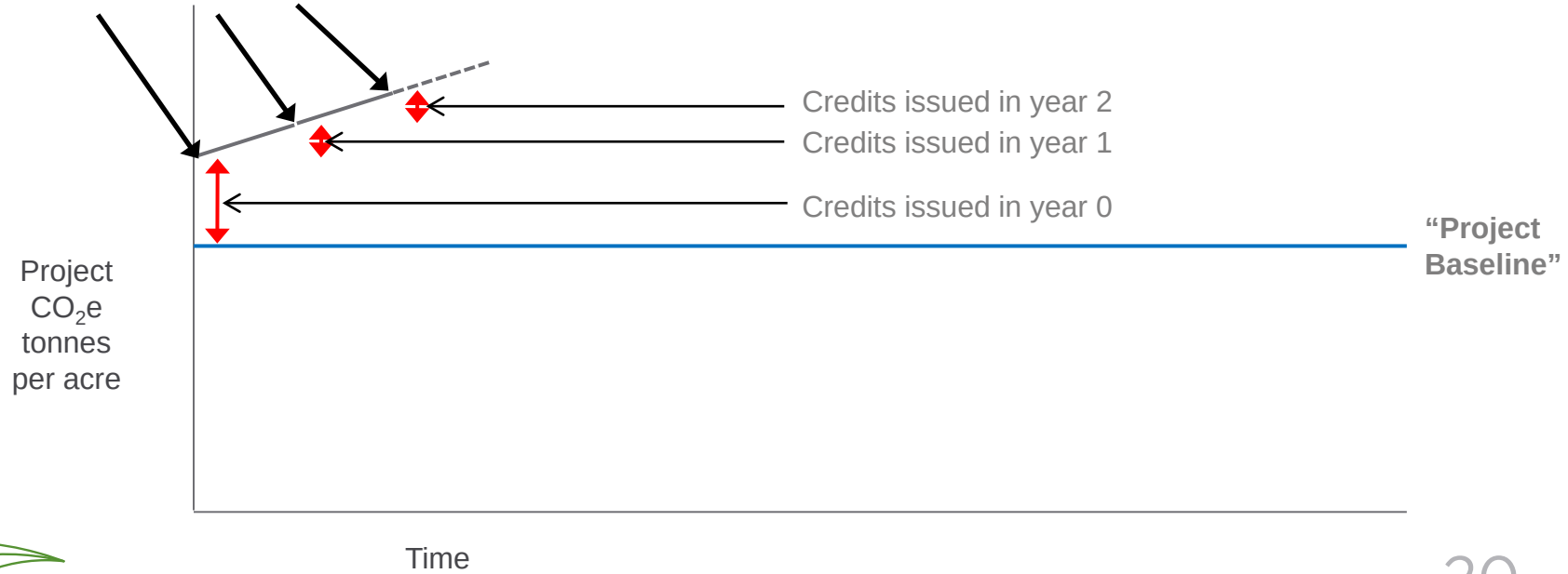


Example IFM Carbon Crediting

- Carbon offset credits may be issued for additional carbon stored by the project as compared to the baseline, after deductions for an insurance pool and other factors.
- Credits can be issued on an annual basis as more carbon is sequestered and stored in the growing forest and its carbon pools.
- The California system requires third party verification and regular monitoring to ensure credits have integrity and the emissions reductions are permanent.

Quantifying the Project Carbon Credits

Actual CO_2e stock estimated from forest carbon inventory and sales of wood products
= **"Project Scenario – Actual Carbon Stock"**



Landowner & Investor Considerations

Carbon projects can provide additional revenue streams that can increase the value of certain forests, but projects must adhere to strict guidelines to ensure the integrity of the cap-and-trade scheme.

Landowner Obligations

- A commitment to maintain any carbon stocks sold for 100 years from the date of sale on the project area.
- Landowners can exit project at any time but must purchase and retire carbon offsets to replace credits issued to the project (plus some additional credits if exiting the project in years 1-50).
- Conservation easements are not required (except for avoided conversion projects).

Forest Management

- Harvesting is allowed, but carbon sold must be maintained on property. If carbon stocks fall below the level to which credits have been issued, credits must be retired to cover the harvest.
- Natural forest management and sustainable harvesting of native species must be employed.
- There is no penalty for unintentional destruction of carbon stocks (e.g. fire) – covered by buffer insurance mechanism.

Monitoring and Reporting

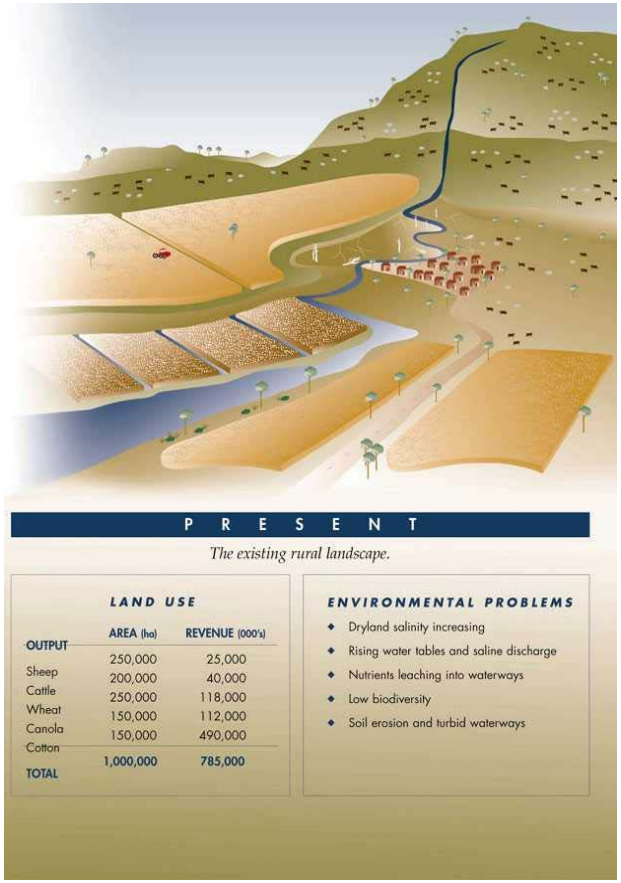
- Annual carbon accounting reports (desk report).
- On-site verification must occur at least every 6 years.
- Full re-inventory must be carried out every 12 years.

New Forests' Forest Carbon Partners

- Forest Carbon Partners (FCP) is an investment fund managed by New Forests.
- FCP provides project finance, development, and credit sales services for forest owners who wish to participate in the California carbon market.
- FCP primarily works with family, industrial, and tribal landowners to create carbon offset projects that deliver real financial value – increasing and diversifying revenue for timberland owners.
- Timberland owners can manage forests for both log sales and carbon offset sales, providing meaningful additional current income while helping transition a forest towards older stands and higher-value wood products.

Towards the Future

Mechanisms to price ecosystems via carbon markets or mitigation banking markets could produce the basis for the stabilisation of conservation and production functions into sustainable landscapes. Environmental markets investments can be direct, standalone investments or take place alongside commercial timber investment.



PRESENT

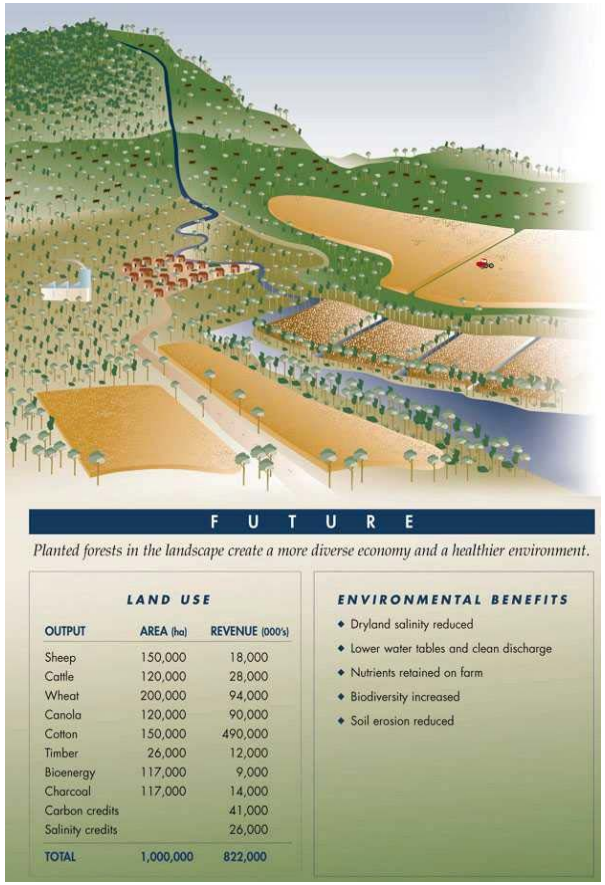
The existing rural landscape.

LAND USE

OUTPUT	AREA (ha)	REVENUE (000's)
Sheep	250,000	25,000
Cattle	200,000	40,000
Wheat	250,000	118,000
Canola	150,000	112,000
Cotton	150,000	490,000
TOTAL	1,000,000	785,000

ENVIRONMENTAL PROBLEMS

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



FUTURE

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
TOTAL	1,000,000	822,000

ENVIRONMENTAL BENEFITS

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

Revenue streams from pricing ecosystem services provide option value and new opportunities in forestry and land management for institutional capital.

Source: New Forests.

Want to Learn More?

To learn more about New Forests' investment programs in mitigation banking and forest carbon in the United States contact Radha Kuppalli at rkuppalli@newforests.com.au.