Ecosystem Services Work Group Meeting #4



October 17, 2024 9am-12pm

Presented by: Mackenna Milosevich
and Greene Economics

Agenda

Welcome & Overview	9:00-9:10
Habitat and Biodiversity	9:10-9:30
Blue Carbon	9:30-9:50
Avoided Wildfire	9:50-10:10
Voluntary Carbon	10:10-10:30
Discussion	10:30-10:45
Break	10:45-10:55
Water Quality	10:55-11:10
Water Quantity	11:10-11:25
Regulatory Carbon	11:25-11:45
Discussion	11:45-11:55
Next Steps and Final Remarks	11:55-12:00

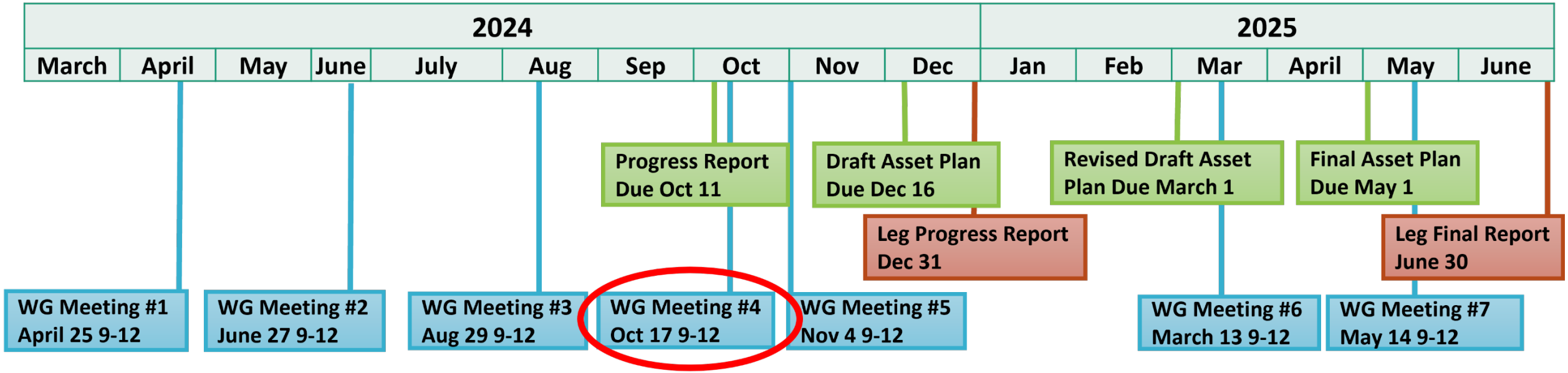
Before we get started

- This is a public meeting and is being recorded.
- Only the Work Group members have access to the chat, not members of the public.
- We will have designated times to address questions throughout the meeting.
- Please keep cameras on.
- Please keep microphones off unless speaking.
- Materials, including the meeting recording, will be shared after the meeting and available on the Work Group website.

Role of the Work Group

- Advise the technical contractor and DNR to guide the technical analyses and development of the ecosystem services asset plan
- Share relevant experiences and applicable expertise
- Provide counsel based on the interests and perspectives of the stakeholder group they represent
- Provide feedback to DNR pertaining to ecosystem services markets
- DNR has the final authority over the analyses, methods, and content of the legislative report

Ecosystem Services Project Timeline



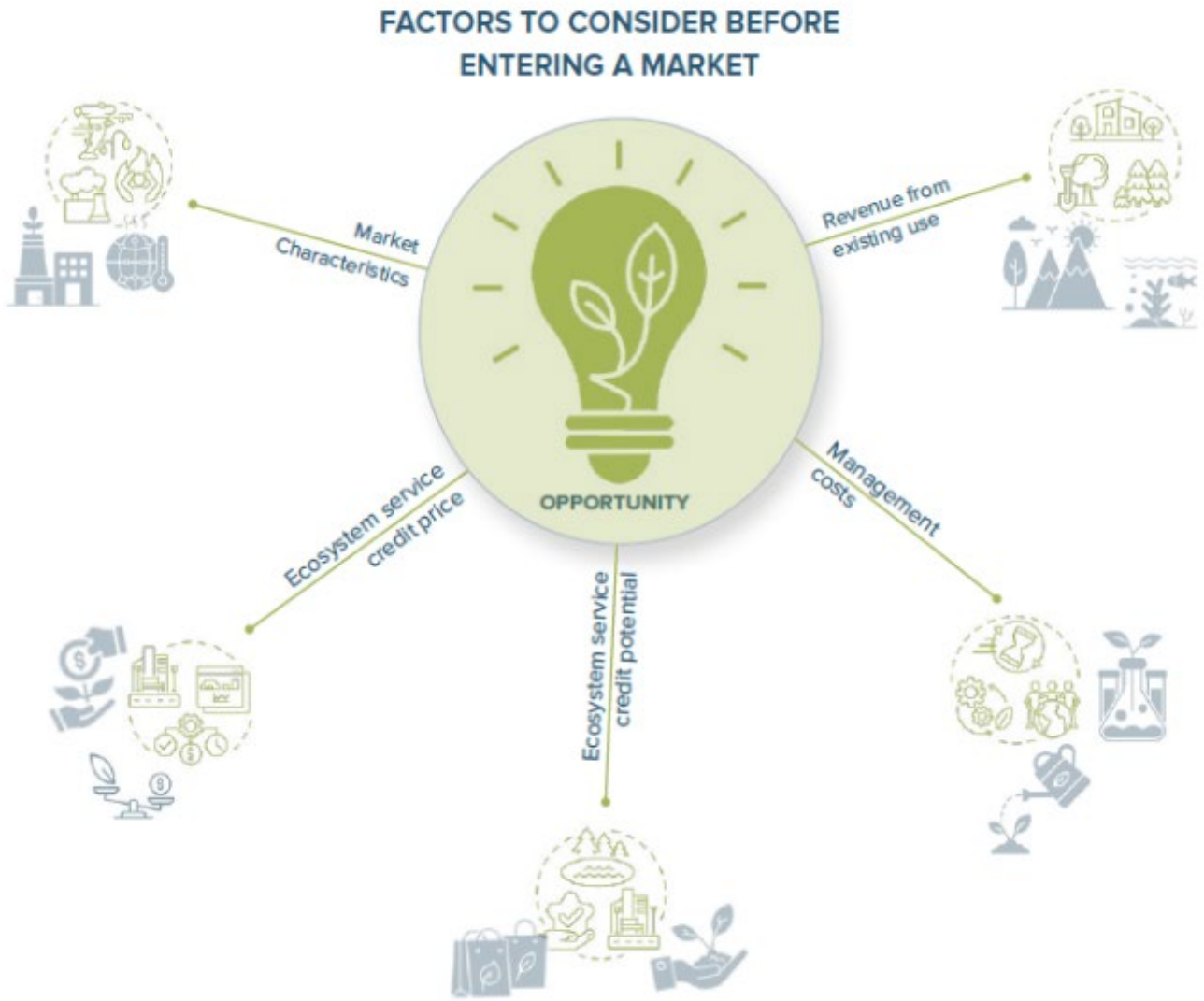
DNR Legislative Reports

Greene Economics Products

Work Group Meetings



Market Opportunities and Challenges



*Subject to changes and amendments

Market Alignment Criteria

- Revenue Potential
- Maturity of Market
- Timing of Maturity
- Ease of Entry
- Labor Lift to Enter
- Data Availability
- Co-Benefit Potential
- Environmental Benefit
- Political Risk

*Subject to changes and amendments

Initial Market Assessment

- Market Definition
- Market Maturity
- Requirements to Offer Offset Credits
- Market Vulnerabilities and Risks
- Unique Considerations for DNR
- Examples from Other States
- Market Alignment Score

*Subject to changes and amendments

Emerging Ecosystem Service Markets

- Carbon Offset Markets
- Blue Carbon Offset Markets
- Water Markets
- Habitat & Biodiversity Markets

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Habitat and Biodiversity Markets – Regulatory

Market Definition:

The regulation-based biodiversity offset market in the US is intended to balance direct environmental damage with environmental improvement to the same habitat/species through mitigation and conservation banking.

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Habitat and Biodiversity Markets – Voluntary

Market Definition:

The voluntary biodiversity market provides a means to insert financial values for nature into markets, economies, and businesses.

Biodiversity credit:

A certificate that represents a measured and evidence-based unit of positive biodiversity outcome that is durable and additional to what would have otherwise occurred

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Habitat and Biodiversity Markets – Voluntary & Regulatory

Market Maturity:

Mitigation banking is well established in the US.

- 34 mitigation banks in WA

Markets are young and there are numerous schemes in development around the world.

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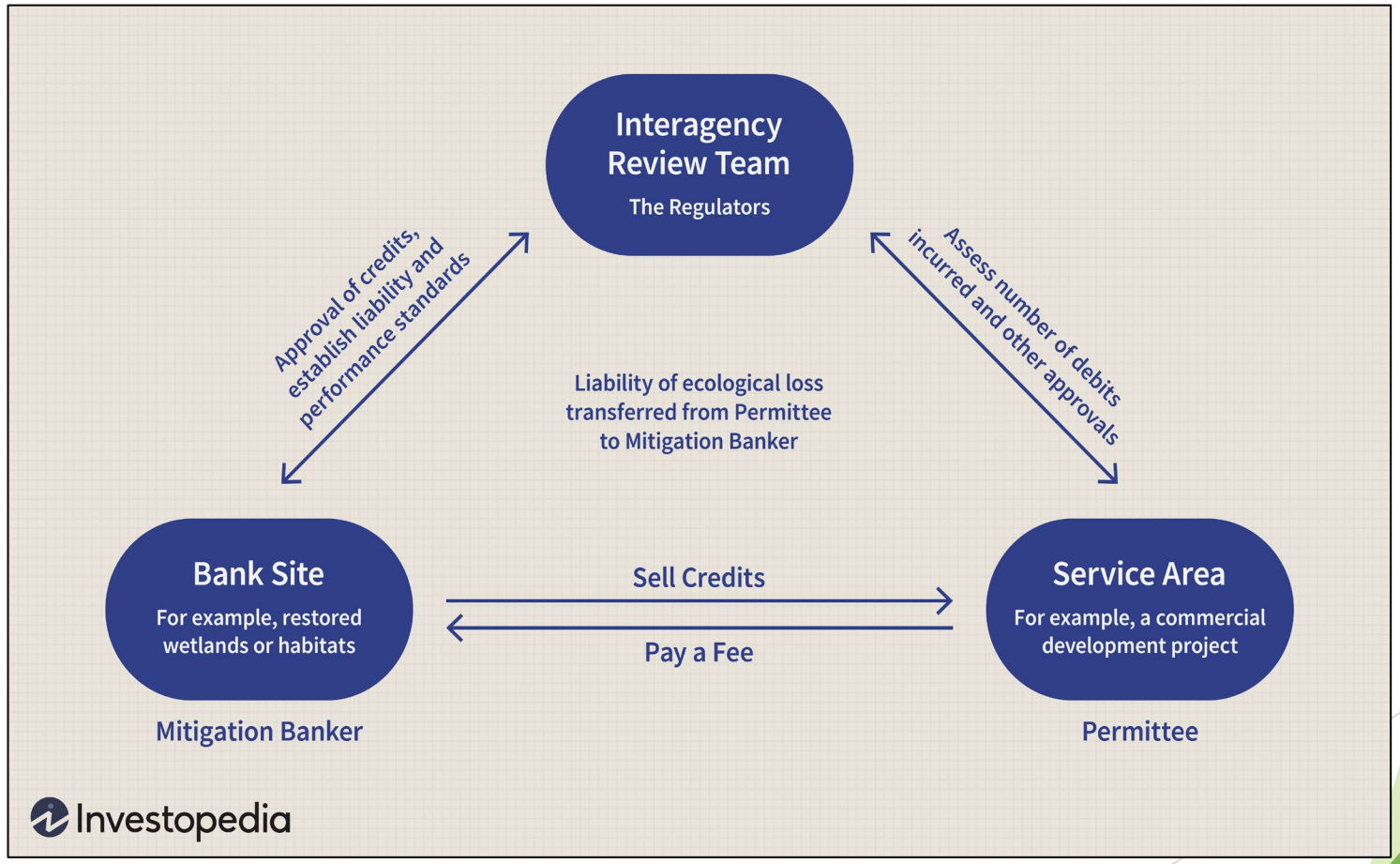
Habitat and Biodiversity Markets – Regulatory

Requirements to Offer Credits:



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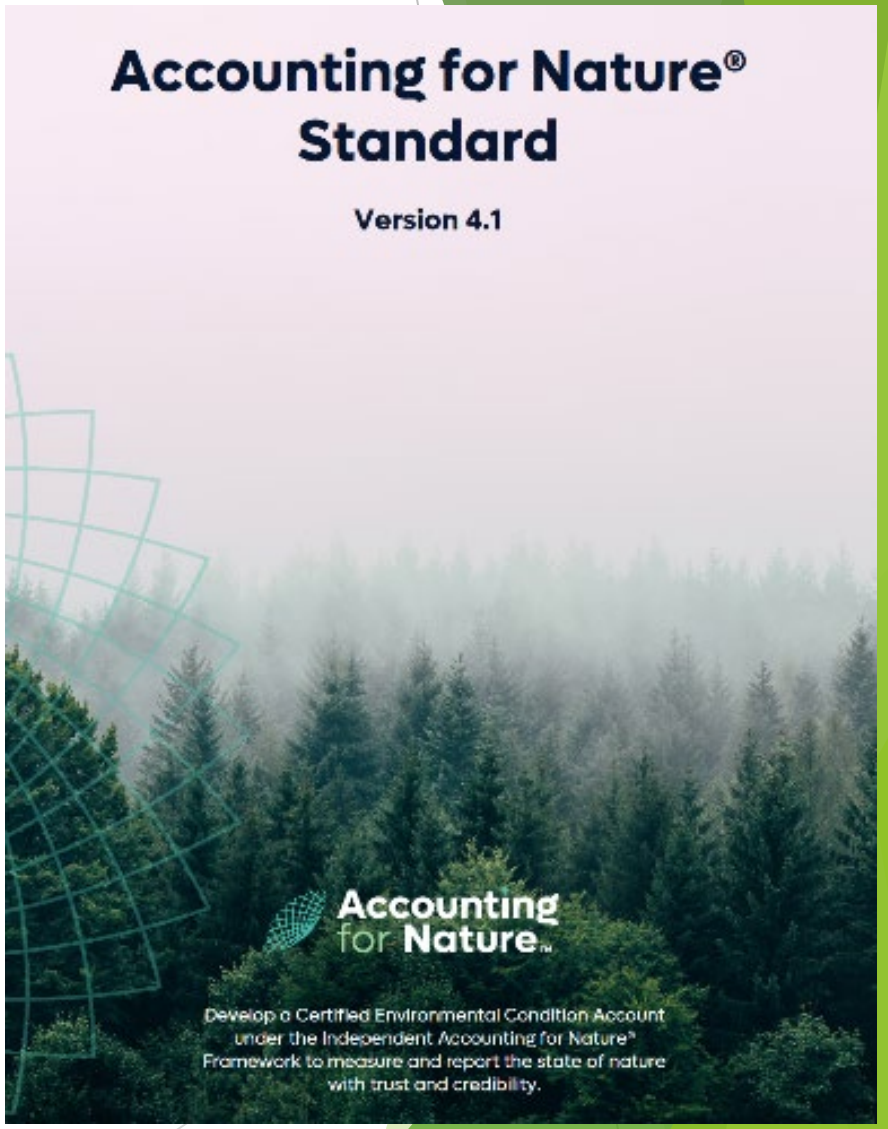
Habitat and Biodiversity Markets – Voluntary

Requirements to Offer Credits:

Markets lack standardization and there are many schemes in action so requirements depends on the market scheme chosen. There are many organizations and taskforces that are currently creating guidelines and standardized biocredit market frameworks.



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Habitat and Biodiversity Markets – Regulatory

Market Vulnerabilities and Risks:

- Market is stable, but smaller than the global market
- Multiple options to meet requirements
- Creating uplift and proving additionality may be challenging

Habitat and Biodiversity Markets – Voluntary

Market Vulnerabilities and Risks:

- Lacking a standard for credit determination (area, timeframe, metrics, geographic scale)
- Biodiversity is inherently complex and difficult to compare one habitat to another

Habitat and Biodiversity Markets – Regulatory & Voluntary

Constraints for DNR:

- DNR doesn't have a methodology or current staff capacity to set up new types of projects
- Feasibility of these types of projects hasn't been tested in the PNW yet

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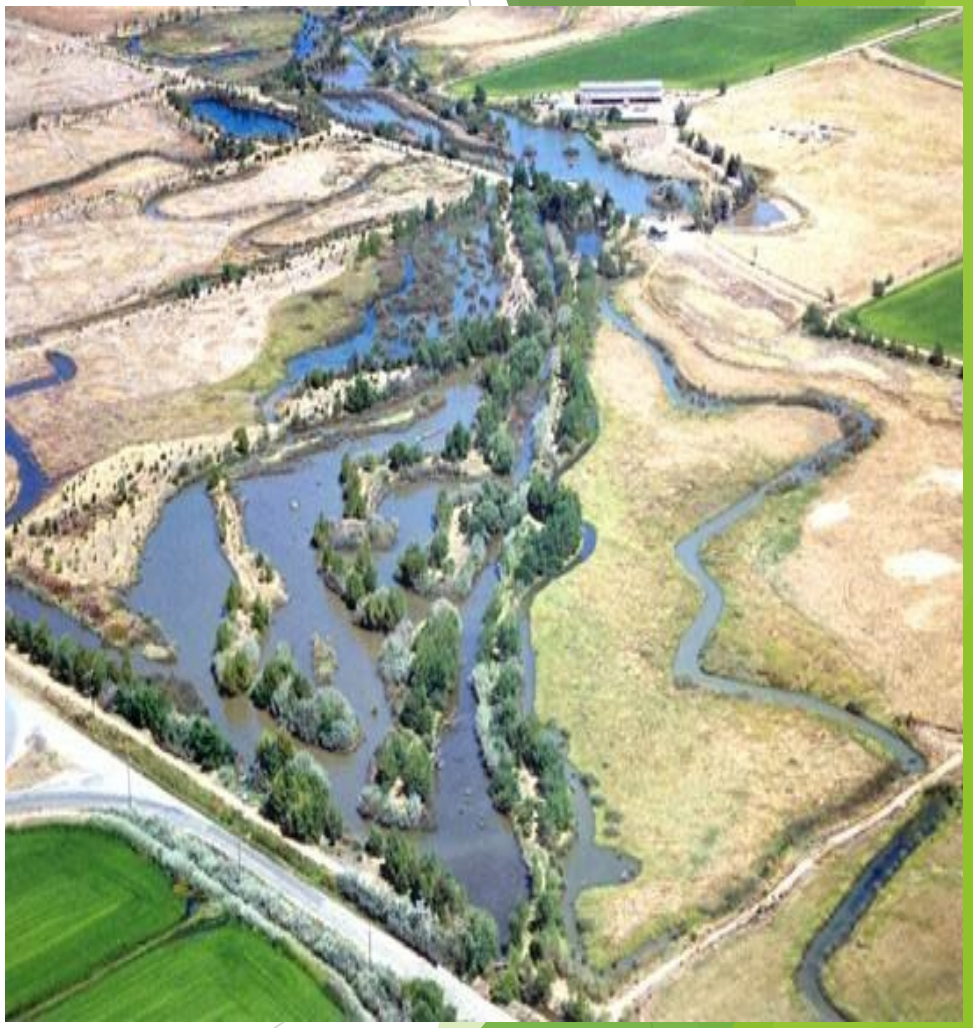
Habitat and Biodiversity Markets – Regulatory

Examples Happening in WA:

North Fork Newaukum Mitigation Bank

- Chehalis Basin 230-acre bank
- Owned by WSDOT, partnered with NRCS
- Approved in 2005
- Have earned 71 out of 78 potential credits
- 25 offset credits have been used to offset 11 WSDOT projects



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Habitat and Biodiversity Markets – Voluntary

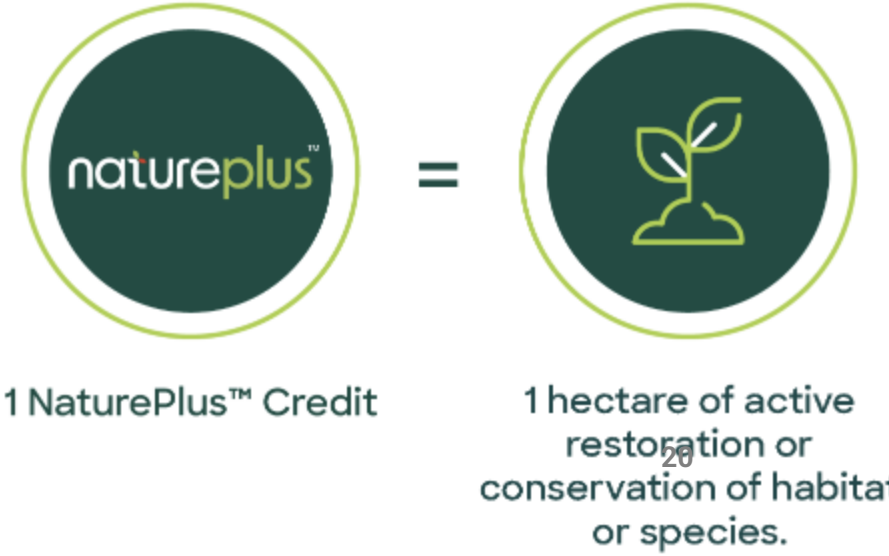
Examples in other countries:

Australian Nature Repair Act, 2023

- Establishing a framework for a world-first legislated, national, voluntary biodiversity market

GreenCollar NaturePlus Credits

- A scientifically robust, world-leading biodiversit credit scheme that values real, measurable results for nature



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Market alignment score

- Habitat And Biodiversity-

Regulatory

Habitat & Biodiversity (Regulatory) Market Alignment Score	
Criteria	Rating
Revenue Potential	3
Environmental Benefit	5
Maturity of Market	5
Ease of Entry	5
Labor Lift	2
Timing of Maturity	5
Data Availability	3
Co-Benefit Potential	4
Political Risk	2
TOTAL	**34**

*Subject to changes and amendments

Market alignment score

- Habitat and Biodiversity-

Voluntary

Habitat & Biodiversity (Voluntary) Market Alignment Score	
Criteria	Rating
Revenue Potential	3
Environmental Benefit	5
Maturity of Market	3
Ease of Entry	5
Labor Lift	4
Timing of Maturity	3
Data Availability	2
Co-Benefit Potential	4
Political Risk	2
TOTAL	**31**

*Subject to changes and amendments

Blue Carbon Market

Market Definition:

Carbon credits generated from carbon sequestration projects in coastal and marine ecosystems.

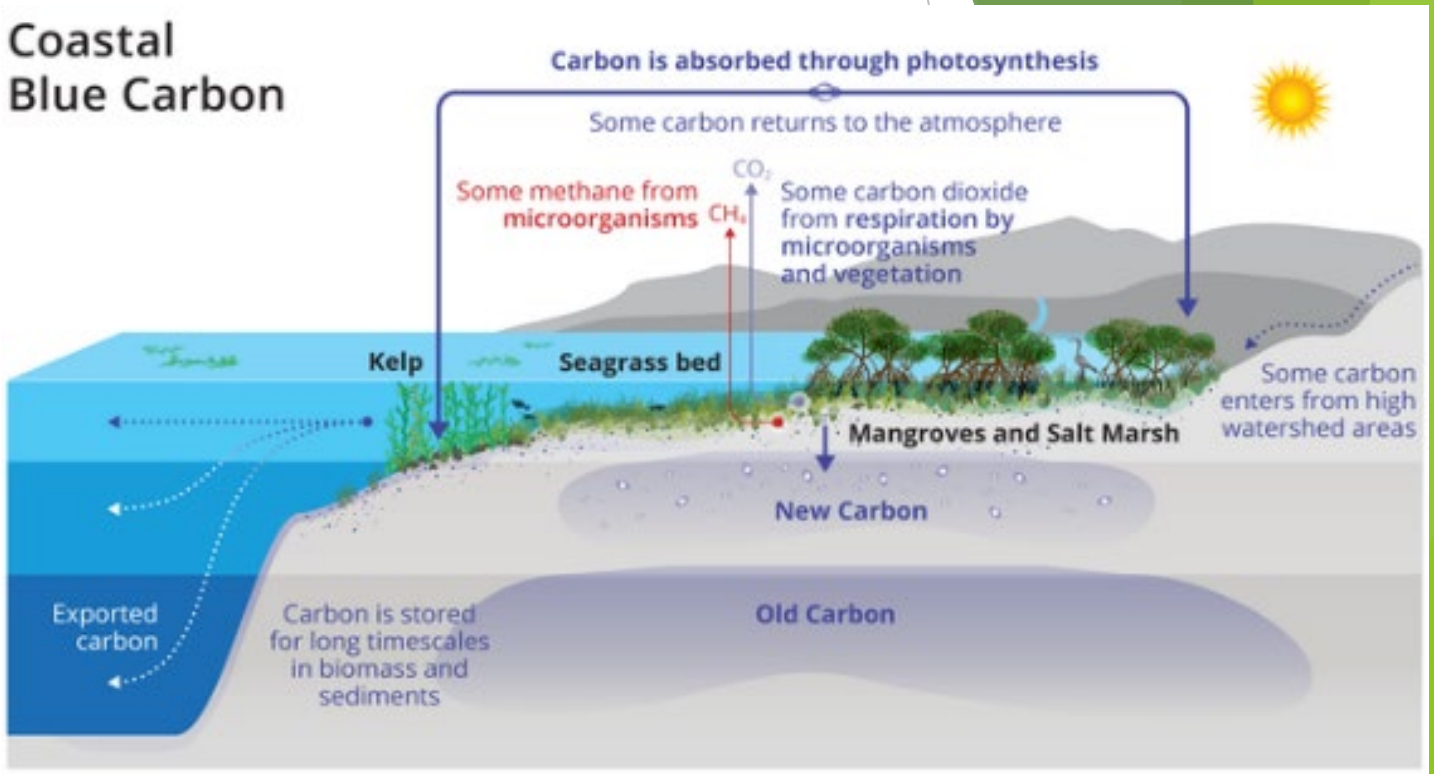

Image Credit: Sarah Battle, NOAA.
Available here.

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Blue Carbon Market

Market Maturity:

Blue carbon credit schemes have only become a viable investment opportunity within the last decade and are usually limited in their scope.

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Blue Carbon Market

Requirements to Offer Credits:

- To offer credits, blue carbon projects need to prove additionality and permanence, minimize risk of leakage, and develop effective record keeping methods

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Blue Carbon Market

Market Vulnerabilities and Risks:

Blue carbon markets currently suffer from a shortage of both supply and demand, as well as a lack of well-defined regulatory guidelines.

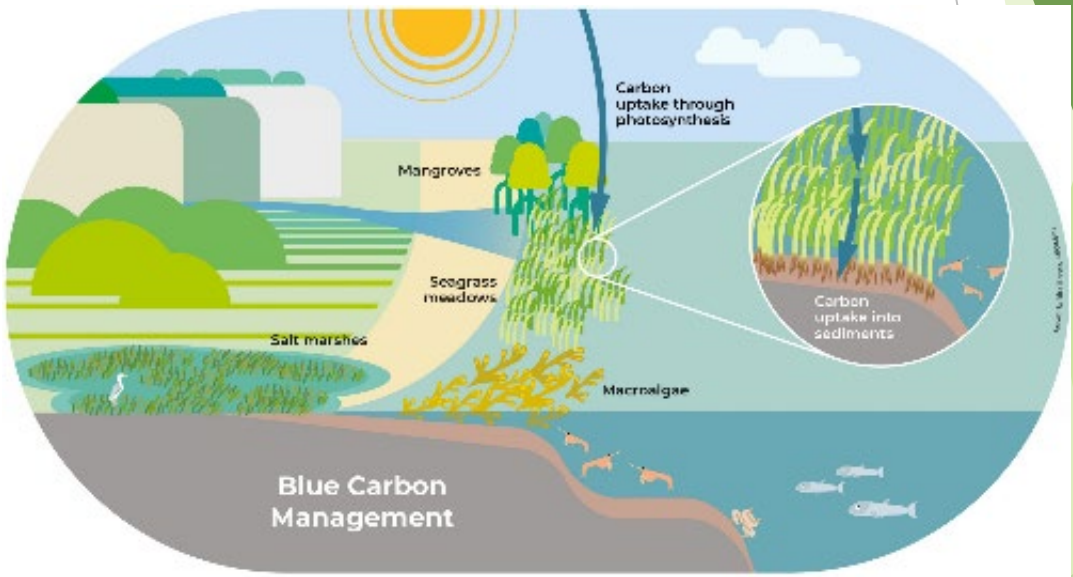

Image Credit: Geomar. Available here.

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Blue Carbon Market

Constraints for DNR:

- The additional labor requirements to develop projects may be cost prohibitive
- The feasibility of these types of projects hasn't been tested in the PNW yet

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Blue Carbon Market

- Lime Green Fill: DNR Owned Seagrass
- Dark Blue Linework: Shellfish Beaches (All Shellfish)
- Brown Linework: Shellfish Beaches (Butter Clams & Varnish Clams)

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Potential Project Area Comparison

Blue Carbon Market

Examples from Other States:

- State and federal governments are currently investing in research
- Baseline data collection

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Market alignment score

- Carbon Markets- Blue Carbon

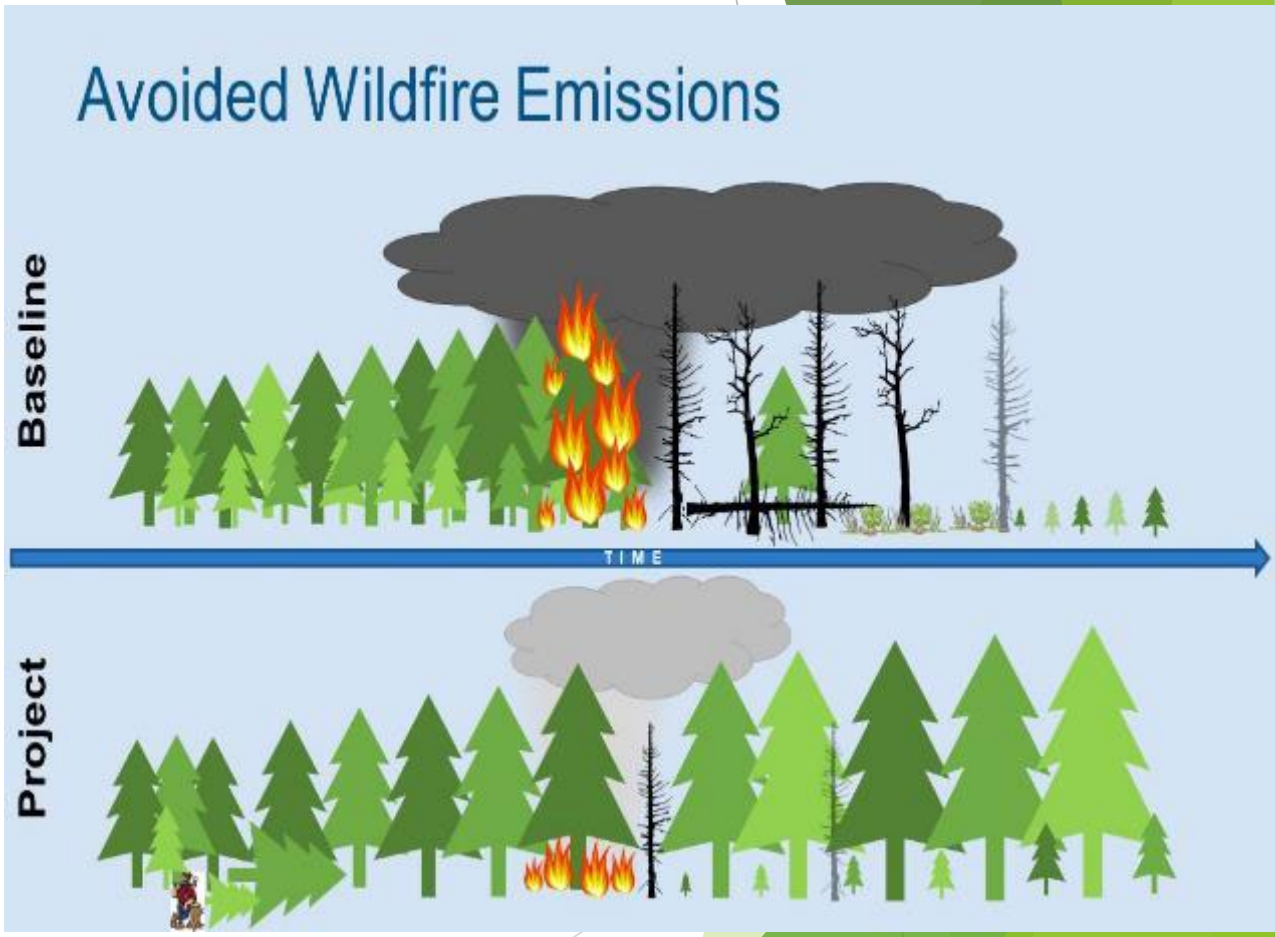
Blue Carbon Market Alignment Score	
Criteria	Rating
Revenue Potential	3
Environmental Benefit	4
Maturity of Market	1
Ease of Entry	5
Labor Lift	3
Timing of Maturity	2
Data Availability	5
Co-Benefit Potential	5
Political Risk	3
TOTAL	**31**

*Subject to changes and amendments

Avoided Wildfire Emissions Markets

Market Definition:

Markets trading credits for reducing wildfire risk generated through proactive forest management, aiming to lower greenhouse gas emissions from potential future wildfires.



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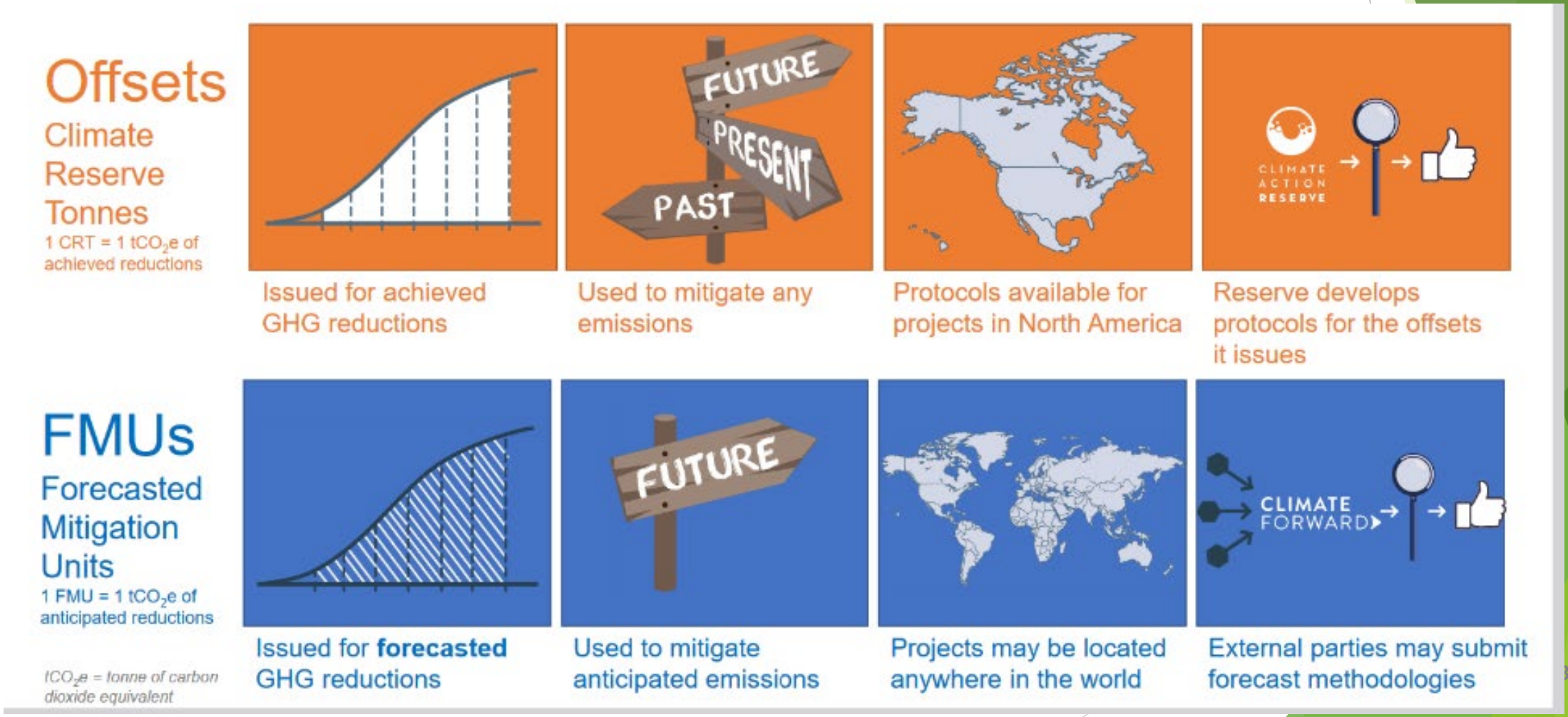
Avoided Wildfire Emissions Markets

Market Maturity: nascent market



Avoided Wildfire Emissions Markets

Entry Requirements:

- Have an active account on the Climate Forward Registry to propose a project
- Can be on public or private lands in the Western United States (Washington is eligible)
- Must be on lands with greater than 10% tree canopy cover for at least 20 years
- Must have sufficient data to quantify project
- Must meet other eligibility requirements (additionality, performance, legal, etc.)

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Avoided Wildfire Emissions Markets

Vulnerabilities and Risks:

- Still in concept stage
- Wildfire may reduce stock
- Inadequate monitoring of emissions reductions, creating potential for credit fraud

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Avoided Wildfire Emissions Markets

DNR Constraints:

Beyond previously mentioned limitations affecting carbon offset project potential, existing management practices already limit wildfire emissions, making it difficult to create additionality.

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Avoided Wildfire Emissions Markets

Examples from Other States, Agencies, or Government Entities:

California is leading the development of protocols for these types of projects.

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Market alignment score

- Carbon Markets- Avoided Wildfire Emissions

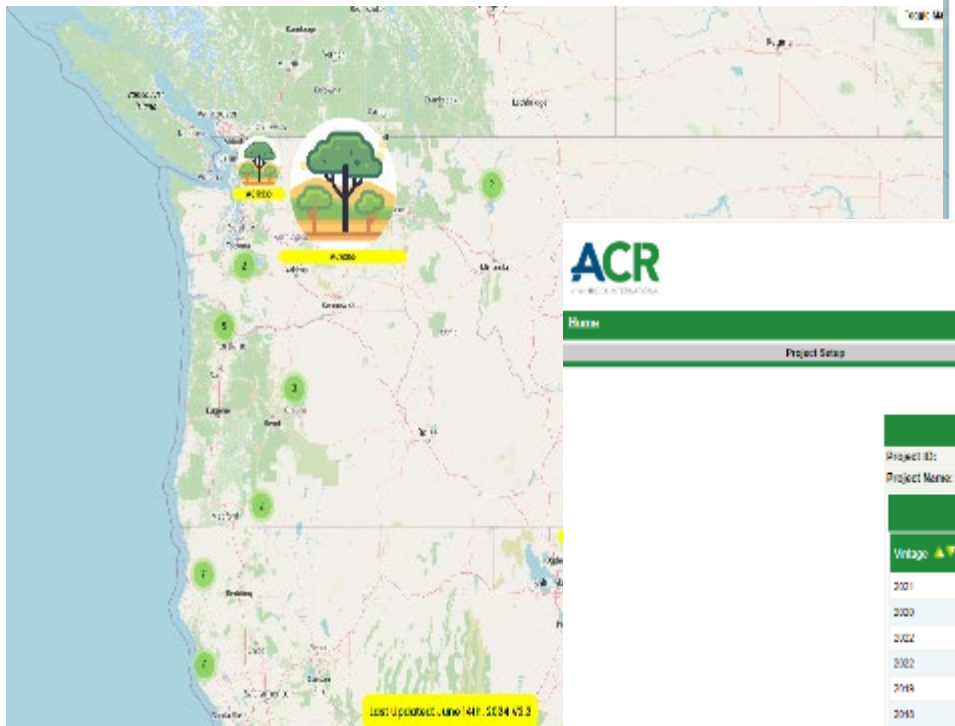
Avoided Wildfire Emissions Market Alignment Score	
Criteria	**Rating**
Revenue Potential	3
Environmental Benefit	5
Maturity of Market	1
Ease of Entry	5
Labor Lift	2
Timing of Maturity	2
Data Availability	3
Co-Benefit Potential	5
Political Risk	5
TOTAL	**31**

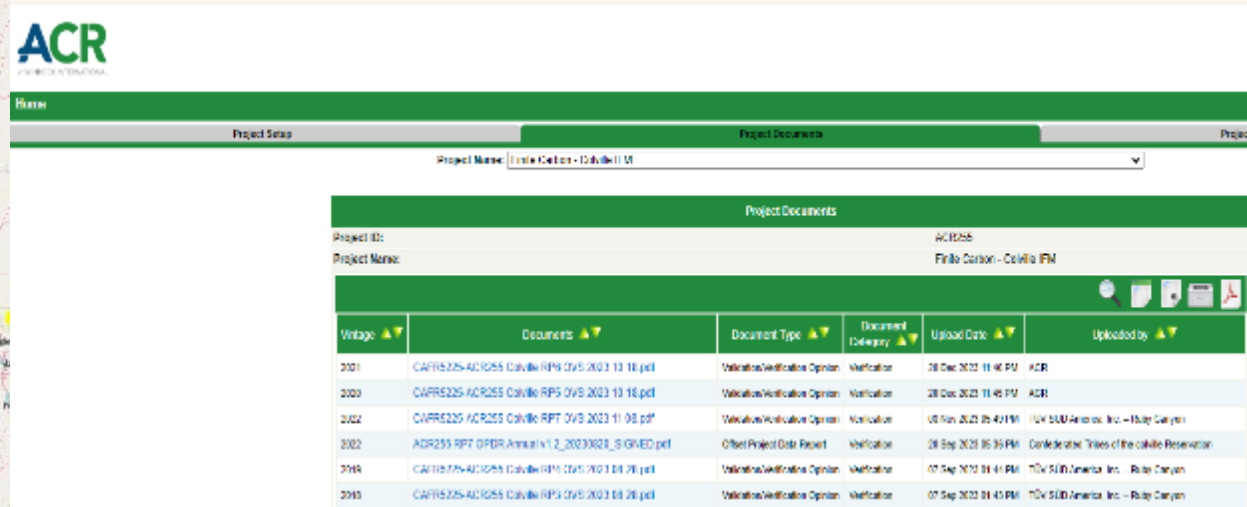
*Subject to changes and amendments

Carbon Markets – Voluntary

Market Definition:

A market where businesses and individuals purchase carbon credits voluntarily to offset emissions, driven by sustainability goals rather than legal requirements.





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Carbon Markets – Voluntary

Market Maturity:

The global voluntary carbon market is valued at $2 billion, with over 20 million metric tons traded in 2021 (Ecosystem Marketplace, 2021).

Ecosystem Marketplace. (2021). *State of the Voluntary Carbon Markets 2021*. Forest Trends. Retrieved from Ecosystem Marketplace

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Carbon Markets – Voluntary

Entry Requirements:

Projects must demonstrate additionality, follow recognized methodologies, undergo third-party verification, and comply with registries' standards for credit issuance.

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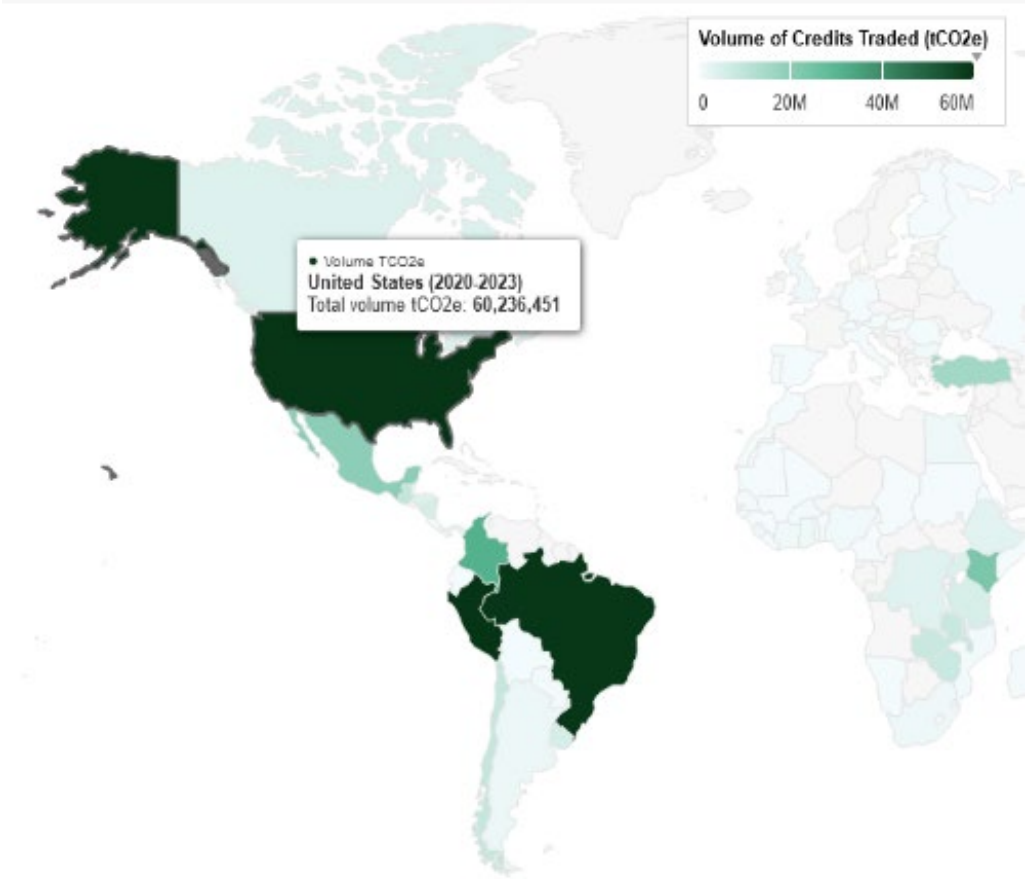
Carbon Markets – Voluntary



Market Vulnerabilities and Risks:

- Overestimated carbon reductions
- Inadequate project verification
- Market manipulation
- Regulatory changes
- Challenges in ensuring long-term credit permanence

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Carbon Markets – Voluntary

DNR Constraints:

- Budget limitations
- Lack of expressed authorization for direct participation,
- Staff capacity and carbon project expertise,
- Project feasibility assessments
- Balancing conservation goals with trust obligations

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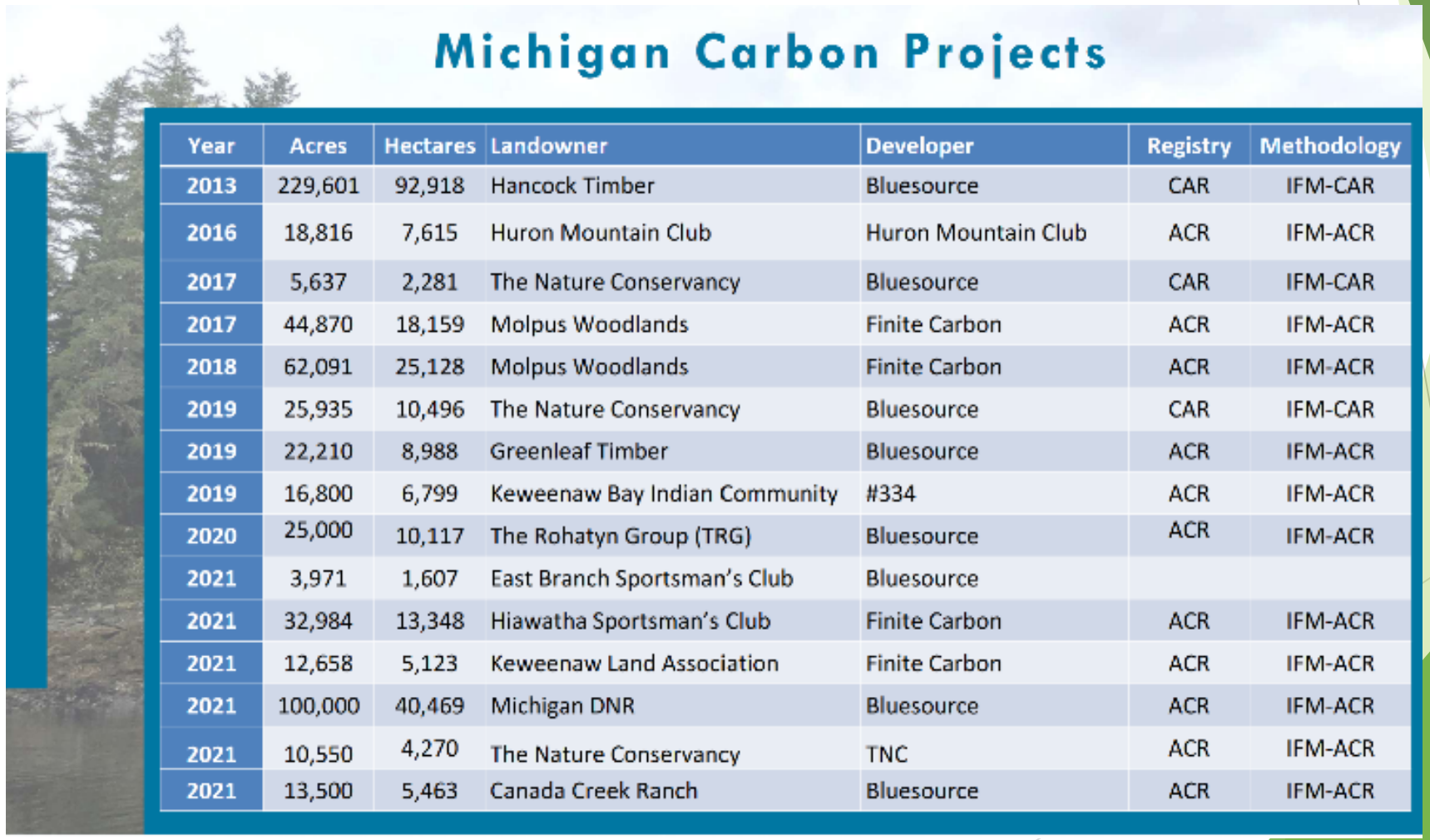
Carbon Markets – Voluntary

Examples from other States, Agencies, and/or Government Entities



Michigan Carbon Projects

Year	Acres	Hectares	Landowner	Developer	Registry	Methodology
2013	229,601	92,918	Hancock Timber	Bluesource	CAR	IFM-CAR
2016	18,816	7,615	Huron Mountain Club	Huron Mountain Club	ACR	IFM-ACR
2017	5,637	2,281	The Nature Conservancy	Bluesource	CAR	IFM-CAR
2017	44,870	18,159	Molpus Woodlands	Finite Carbon	ACR	IFM-ACR
2018	62,091	25,128	Molpus Woodlands	Finite Carbon	ACR	IFM-ACR
2019	25,935	10,496	The Nature Conservancy	Bluesource	CAR	IFM-CAR
2019	22,210	8,988	Greenleaf Timber	Bluesource	ACR	IFM-ACR
2019	16,800	6,799	Keweenaw Bay Indian Community	#334	ACR	IFM-ACR
2020	25,000	10,117	The Rohatyn Group (TRG)	Bluesource	ACR	IFM-ACR
2021	3,971	1,607	East Branch Sportsman's Club	Bluesource		
2021	32,984	13,348	Hiawatha Sportsman's Club	Finite Carbon	ACR	IFM-ACR
2021	12,658	5,123	Keweenaw Land Association	Finite Carbon	ACR	IFM-ACR
2021	100,000	40,469	Michigan DNR	Bluesource	ACR	IFM-ACR
2021	10,550	4,270	The Nature Conservancy	TNC	ACR	IFM-ACR
2021	13,500	5,463	Canada Creek Ranch	Bluesource	ACR	IFM-ACR

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Market alignment score

- Carbon Markets - Voluntary

Voluntary Carbon Market Alignment Score	
Criteria	**Rating**
Revenue Potential	3
Environmental Benefit	4
Maturity of Market	4
Ease of Entry	2
Labor Lift	4
Timing of Maturity	4
Data Availability	5
Co-Benefit Potential	3
Political Risk	3
TOTAL	**32**

*Subject to changes and amendments

Discussion

- Do you have any questions about any of the Ecosystem Services markets presented so far? These were Habitat and Biodiversity, Blue Carbon, Avoided Wildfire Emissions, and Voluntary Carbon.

- Is there anything else you would like to add or share about these markets?

BREAK (10 min.)

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Water Quality Markets

Market Definition:

Water quality markets enable trading of water quality credits, allowing regulated entities to offset pollution by investing in projects that improve water quality in other locations.

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Water Quality Markets

Market Maturity:

- Water rights markets are mature – for sale or lease
- Water quality markets are all new in PNW, however stormwater credit trading and other nutrient systems are more widely used elsewhere in the U.S.

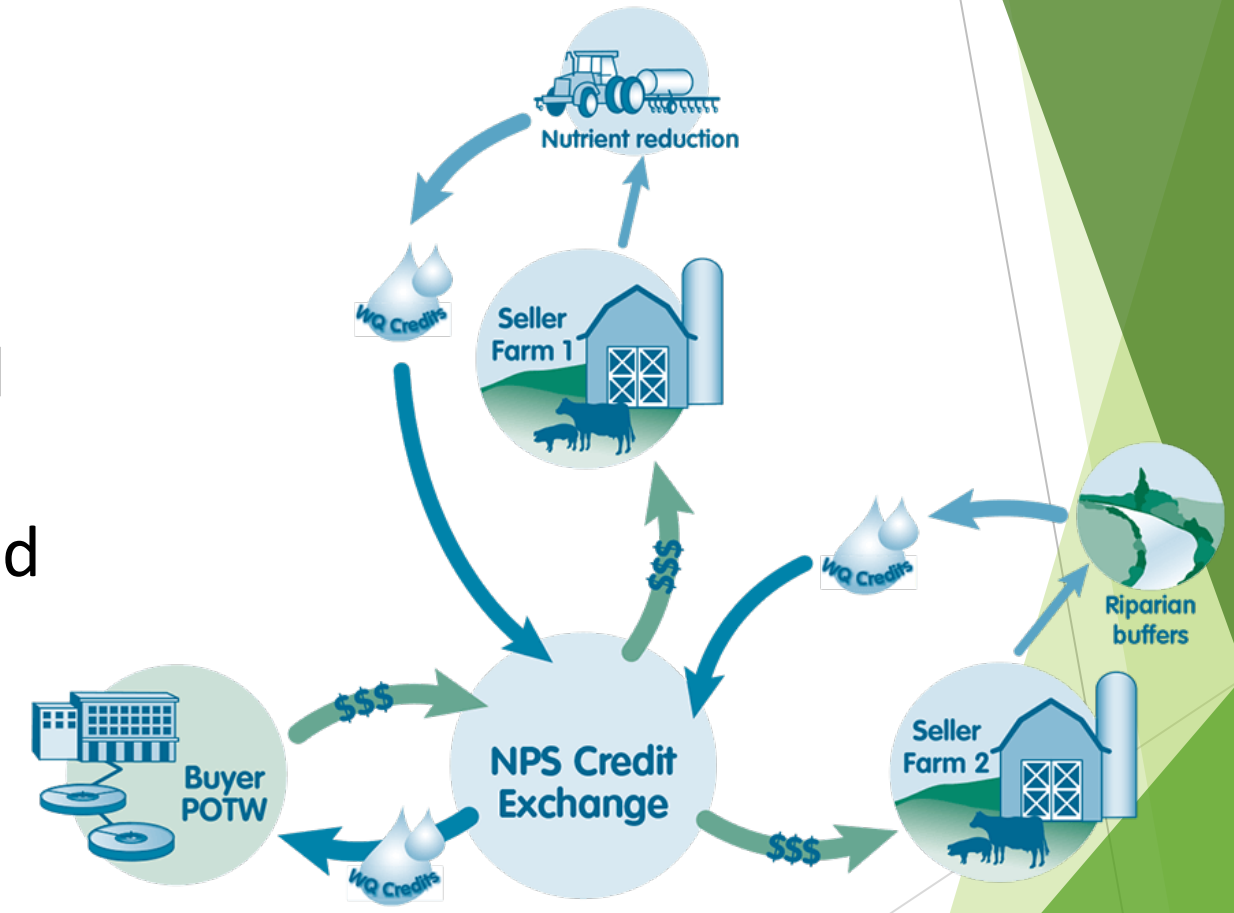

Image Credit: Haimann, Richard, and Srinivasan Rangarajan. "Is Urban Stormwater Ready for Pollutant Trading? Long Island Sound Pollutant Trading Initiative." *WEFTEC* 2013. Water Environment Federation, 2013.

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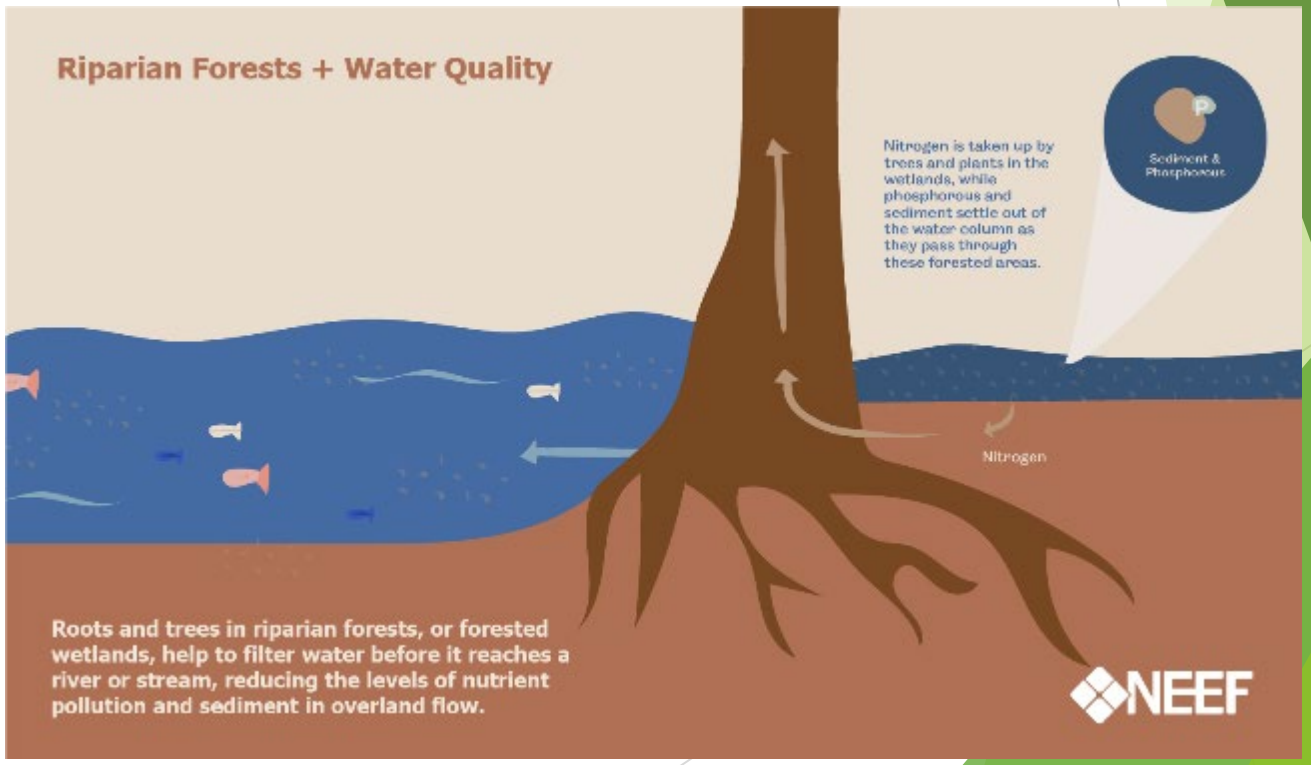
Water Quality Markets

Entry Requirements:

Washington's Clean Water Act framework supports water quality trading via NPDES permits, but there are no substantial regulatory drivers for water quality markets at present, meaning participation is largely voluntary and subject to evolving regulations.



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Water Quality Markets

Vulnerabilities and Risks:

- Regulatory gaps
- Market complexity

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Water Quality Markets

DNR Constraints:

Current Washington statutes, such as RCW 90.03.010 and RCW 90.42.005, do not provide explicit authority for DNR to engage in water quality trading.

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Water Quality Markets

Examples from Other States, Agencies, and/or Government Entities:

- Wisconsin DNR; Lower Fox River Watershed
- Virginia; nutrient crediting exchange
- Ohio, Indiana, and Kentucky; world's largest trading program for the Ohio River Basin

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Market alignment score

- Water Quality

Water Quality Market Alignment Score	
Criteria	Rating
Revenue Potential	2
Environmental Benefit	5
Maturity of Market	3
Ease of Entry	4
Labor Lift	4
Timing of Maturity	4
Data Availability	3
Co-Benefit Potential	5
Political Risk	3
TOTAL	**33**

*Subject to changes and amendments

Water Quantity Markets

Market Definition:

Water quantity markets involve trading water rights to improve watershed services, such as maintaining minimum water flows for environmental benefits, through mechanisms like leases or sales of water rights between users.

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Water Quantity Markets

Market Maturity:

Water quantity markets are very well developed in Washington. DNR holds some water rights, offering potential opportunities for leasing.

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Water Quantity Markets

Entry Requirements:

DNR lacks explicit legislative authority to engage in water quantity markets, and Washington statutes such as RCW 90.03.010 do not provide explicit authority to lease water rights.

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Water Quantity Markets

Vulnerabilities and Risks:

Water quantity markets face higher volatility due to variable water availability influenced by climate change, which could lead to price Instability and allocation conflicts.

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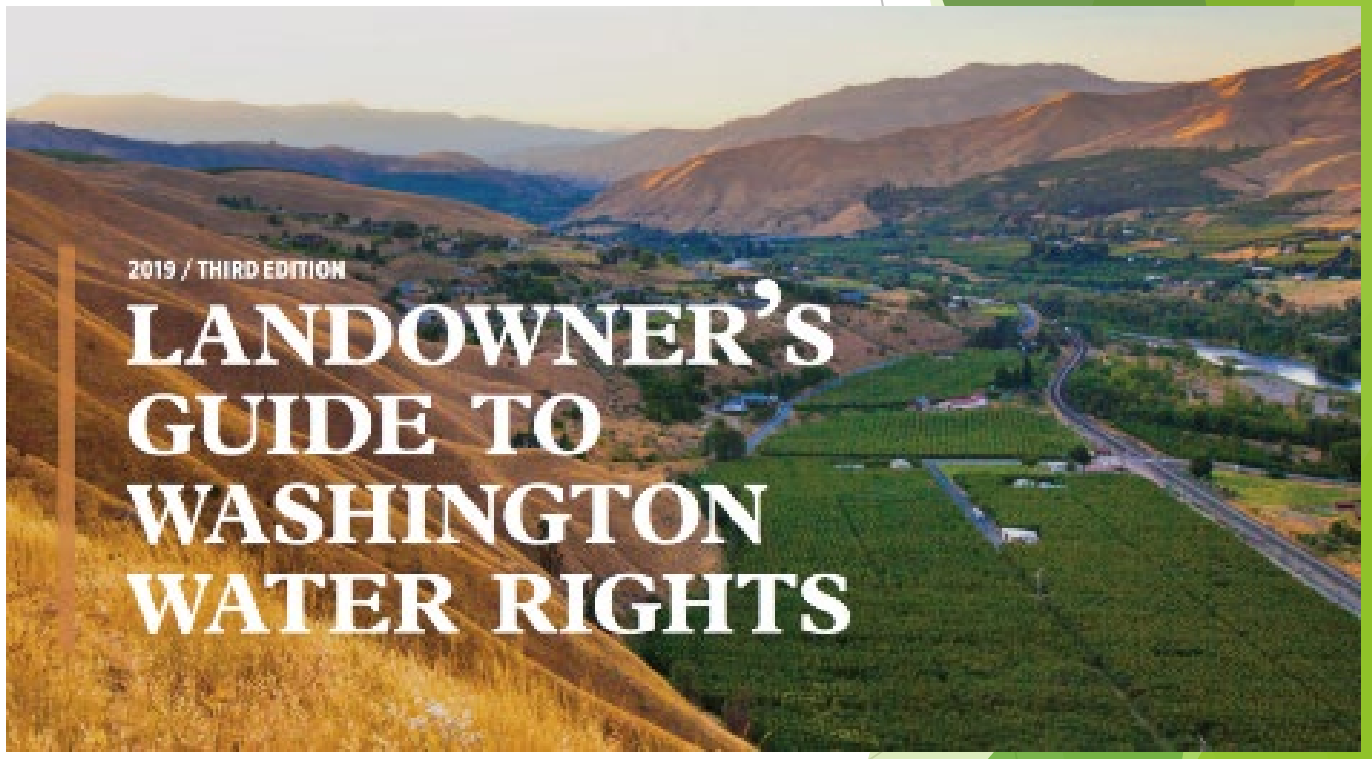
Water Quantity Markets

DNR Constraints:

DNR faces similar constraints in water quantity markets as in water quality markets, with statutes like RCW 90.03.010 that does not provide explicit authority for DNR to engage in water quantity markets.



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Water Quantity Markets

Examples from Other States, Agencies, and/or Government Entities:

In California, the most developed water market in the U.S., ~1.5 million acre-feet of water are traded annually through short-term leases and permanent sales, primarily within the same county or region.

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Market alignment score

- Water Quantity

Water Quantity Market Alignment Score	
Criteria	**Rating**
Revenue Potential	5
Environmental Benefit	3
Maturity of Market	5
Ease of Entry	2
Labor Lift	4
Timing of Maturity	5
Data Availability	5
Co-Benefit Potential	3
Political Risk	4
TOTAL	**36**

*Subject to changes and amendments

Carbon Markets – Regulated

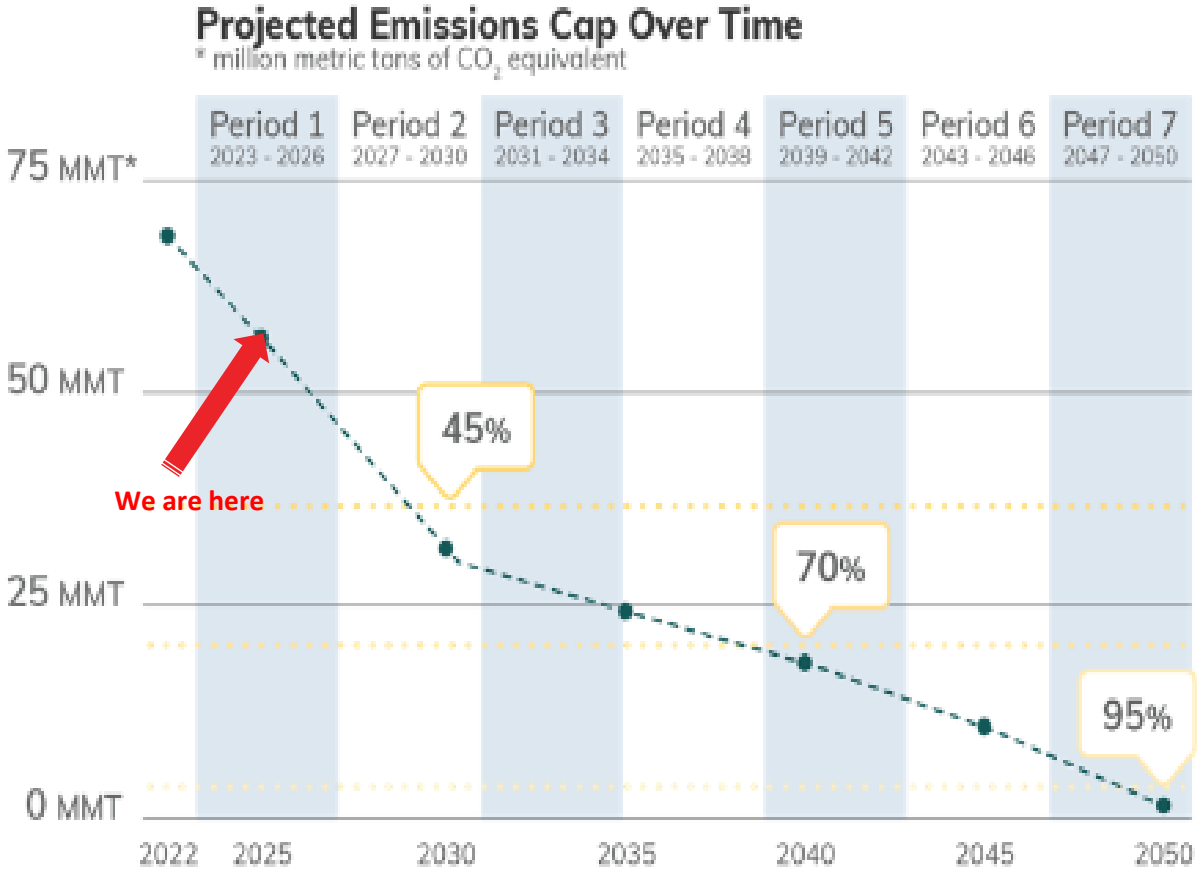

Image Credit: Saunders, Hannah. "Department of Ecology finalizes cap-and-invest plan to cut carbon pollution." 2022. Available here.

Market Definition:

A legally mandated market where businesses trade emission allowances under a cap-and-trade system to comply with government-imposed emission limits.

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Carbon Markets – Regulated

Emissions Year	Total Covered Emissions (WA) (MT CO2e)	Maximum Allocation for Offset Credits (MT CO2e)		
		Tribal (3%)	Other (5%)	TOTAL (8%)
2023	63,288,565	1,898,657	3,164,428	5,063,085
2024	58,524,909	1,755,747	2,926,245	4,681,993
2025	53,761,254	1,612,838	2,688,063	4,300,900
2026	48,997,598	1,469,928	2,449,880	3,919,808

Market Maturity:

The carbon credit market in Washington under CCA is relatively new, as the cap-and-invest program only went into effect on January 1, 2023.

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Carbon Markets – Regulated

Entry Requirements:

- Offsets need to be real, permanent, quantifiable, verifiable, enforceable, and additional
- Detailed modeling is needed, as are verifications
- Ongoing approvals and monitoring are also required

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Carbon Markets – Regulated

Market Vulnerabilities and Risks:

- Ballot initiative to repeal the CCA in Washington
- The market is still in its early stages
- Allowance prices are higher compared to more established markets

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Carbon Markets – Regulated

DNR Constraints:

Lack of expressed authority for DNR to directly participate in the selling of carbon credits

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Carbon Markets – Regulated

Examples from Other States, Agencies, and/or Government Entities:

- California's Cap-and-Trade Program
- Québec's Cap-and-Trade system

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Market alignment score

- Carbon Markets - Regulated

Regulatory Carbon Market Alignment Score	
Criteria	Rating
Revenue Potential	1
Environmental Benefit	4
Maturity of Market	5
Ease of Entry	1
Labor Lift	3
Timing of Maturity	3
Data Availability	5
Co-Benefit Potential	4
Political Risk	2
TOTAL	**28**

*Subject to changes and amendments

Discussion

- Do you have any questions about any of the additional Ecosystem Services markets presented? These were Water Quality, Water Quantity, and Regulatory Carbon.

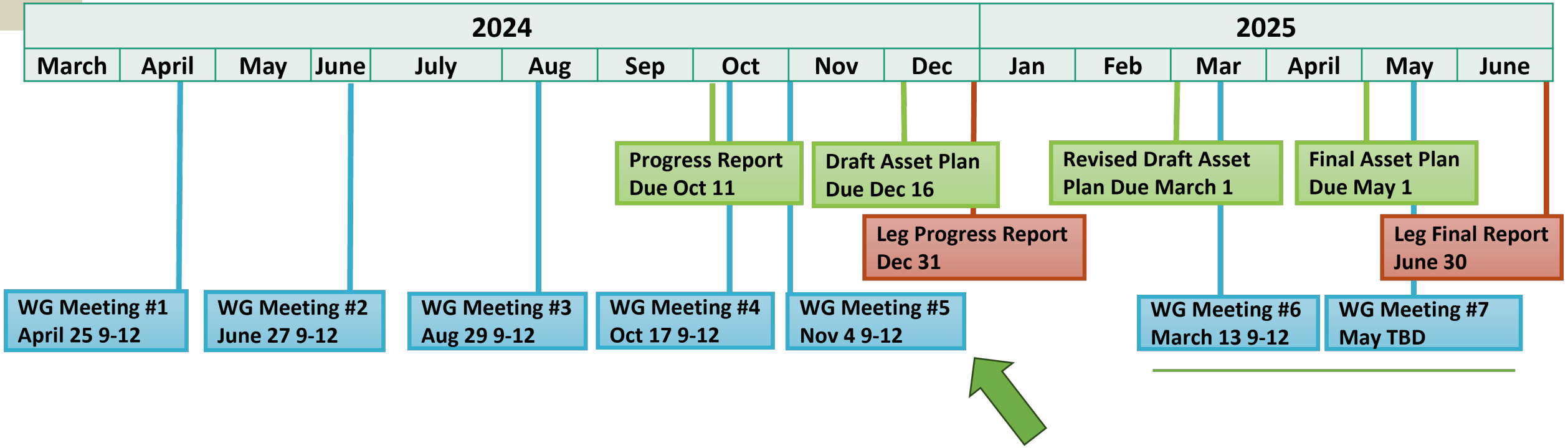
- Is there anything else you would like to add or share about these markets?

Summary of Market Alignment Results

Market	Preliminary Alignment Score	Preliminary Recommendation
Habitat and Biodiversity	34/31	Favorable to Pursue/Further Analysis Needed
Blue Carbon	31	Further Analysis Needed
Avoided Wildfire	31	Further Analysis Needed
Voluntary Carbon	32	Favorable to Pursue
Water Quantity	36	Favorable to Pursue
Water Quality	33	Favorable to Pursue
Regulated Carbon	28	Less Favorable to Pursue

*Subject to changes and amendments

Ecosystem Services Project Timeline



DNR Legislative Reports

Greene Economics Products

Work Group Meetings

Work Group Meetings

- Held via zoom

Meeting	Date	Time	Topic
1	April 25th, 2024	9am-12pm	Introductions & project overview
2	June 27th, 2024	9am-12pm	Inventory & preliminary market landscape
3	August 29th, 2024	9am-12pm	Marginal cost abatement model
4	October 17th, 2024	9am-12pm	Market opportunities and challenges
5	November 4th, 2024	9am-12pm	Draft roadmap, inventory, and dashboard
6	March 13, 2025	9am-12pm	Review draft asset plan and inventory
7	May 14, 2025	9am-12pm	Final asset plan and inventory



Questions?

Our mission: *Manage, sustain, and protect the health and productivity of Washington's lands and waters to meet the needs of present and future generations.*