



Ecosystem Services in Practice: Market-Based Ecosystem Services - From Theory to Application

Speaker

Adam Davis · Dave Batker · Dr. Ben Guillon · Ricardo Bayon

2011 ECOSYSTEM SERVICES SEMINAR SERIES

Ecosystem Services Seminar 5: Ecosystem Services in Practice: Market- Based Ecosystem Services- From Theory to Application

*Presentation and Discussion Notes From Panelists:
Mr. Adam Davis, Mr. David Batker, Mr. Ricardo Bayon,
and Dr. Ben Guillon*

Seminar Series and Seminar 5 Goals:

The goal of the multi-session seminar is to educate the broader conservation community including practitioners and funders on the diverse aspects of ecosystem services – such as how to account for ecosystem services and to effectively measure, manage, and communicate them.

Seminar 5 and associated readings focused on the following goals:

- *Status, and current trends in market-based approaches, including payment for ecosystem services*
- *Strengths and weaknesses of market-based approaches, including risks and benefits associated with specific market approaches*
- *Scale of market-based ecosystem services implementation*

This document is a product of the Gordon and Betty Moore Foundation’s Ecosystem Services Seminar Series that took place between March and November 2011. For more information please visit www.moore.org or request “ES Course Info” from Heather Wright at info@moore.org.

Disclaimer:

This document is a summary that includes PowerPoint slides from the panelists, Mr. Adam Davis, Mr. David Batker, Mr. Ricardo Bayon, and Dr. Ben Guillon, and notes of their talking points. In addition, we provide a synthesis of important questions discussed during Seminar 5. Please keep in the mind that the following document is only a recap of the presentations and Blue Earth Consultants’ notetakers have, to the best of their ability, captured the presentations. We hope that the following presentations and discussion notes will be used as resource to advance further discussions about ecosystem services.



Mr. Adam Davis

- In reviewing the previous seminars, I was captivated by the way the series has captured the progress of the ecosystem services (ES) field and how it has mirrored it perfectly by starting with theory and moving towards the application of concepts. It reminds me vividly of my personal trajectory.
- I remember the first major conference after Gretchen Daily's book, *Nature's Services: Societal Dependence on Natural Ecosystems*, which was a bold book for an academic that discussed the need to address economics beyond science.
- There is a great deal of discussion grappling with the financial value of nature. Are these things real? Are they measurable? How do you do it? Etc.
- Since the Katoomba Group meeting of international thought leaders in early 2000, the field has progressed rapidly.
- At EcosystemMarketplace.com, our contribution really was to take the complexities of ES and to begin to categorize them into water, carbon, and biodiversity markets. My next step was working at an electric power research institute on their ecological asset management program. That was the first attempt to try to assess pure economic value for companies.
- Since then, I have entered the applied side working with large companies like DuPont, and addressing natural resource damages at Seattle superfund sites. Environmental engineering firms, and the federal government are very involved in these sorts of issues. I have spent time working on inter-agency dialogue to make federal environmental program spending more accurate, targeted, and to make regulation more efficient and effective.

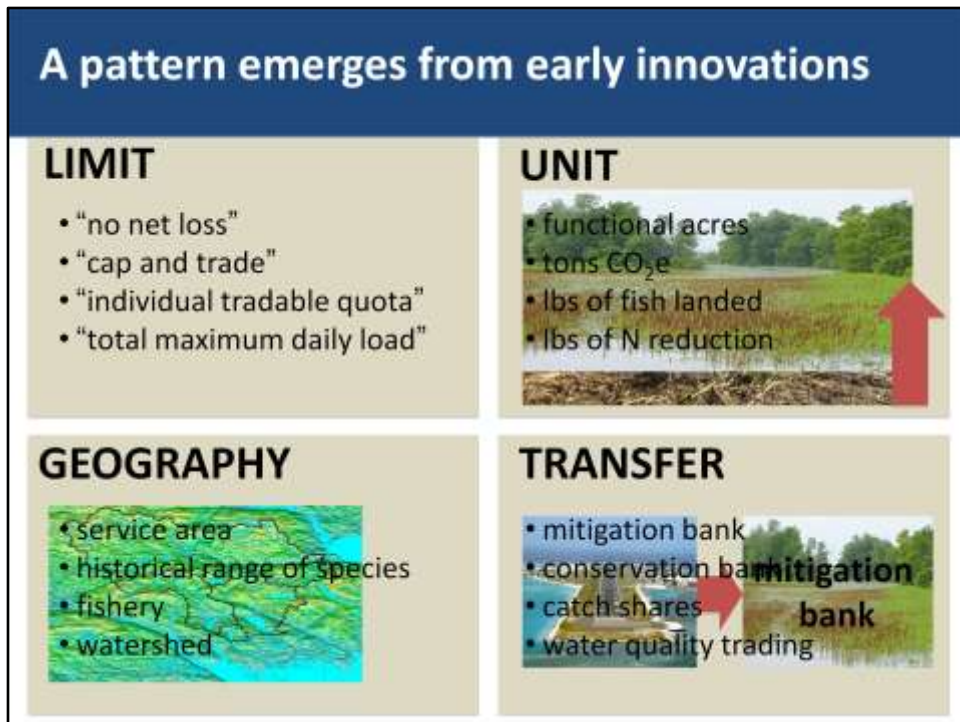
- I am very pleased to moderate this panel. We have excellent case studies that will bring the concepts down to earth in a concrete way.
- I will make two points before we turn to case studies. One is about the breadth of problems to which this idea is being applied. The second is more about the terminology we use in ES. The jargon is confusing and is often a distraction from a simple value.



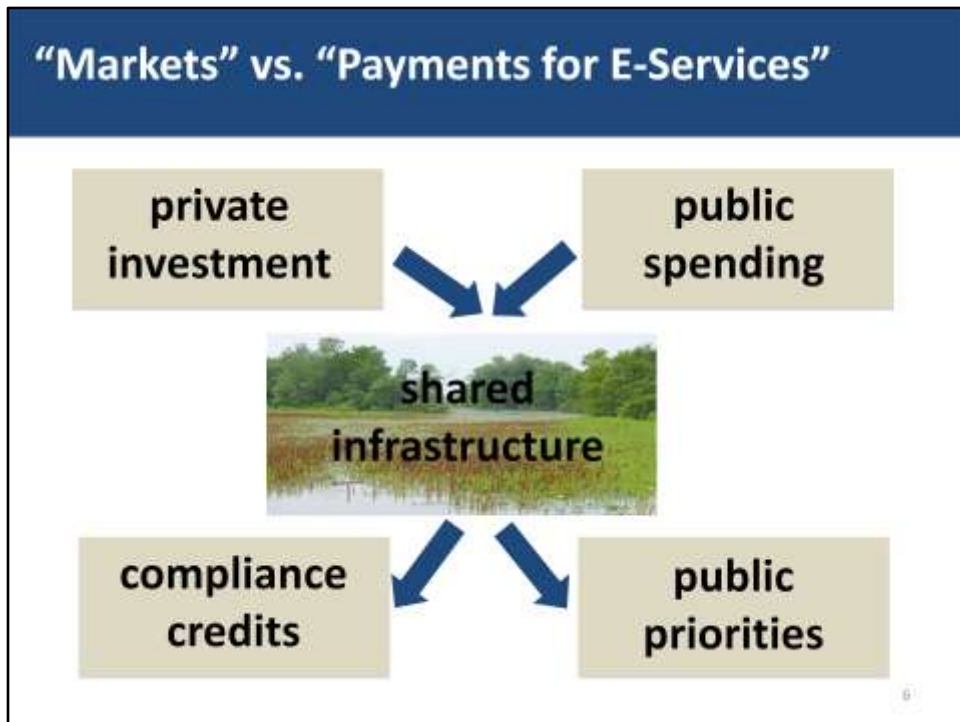
- We have applied environmental law to many places over the years. In every case, the fundamental environmental laws have said “stop it” by basically controlling limits.
- At the time, this tactic of “command and control” was absolutely necessary, but we have since hit a limit of imposing limits.
- We have moved beyond fines and fees to a place where we need to find a balance between economic growth and our need to protect the environment. These ideas are not a notion anymore, we have 20 years experience across a broad range of problems. We need to apply real incentives to not only stop what we do not want, but also to encourage what we do want.



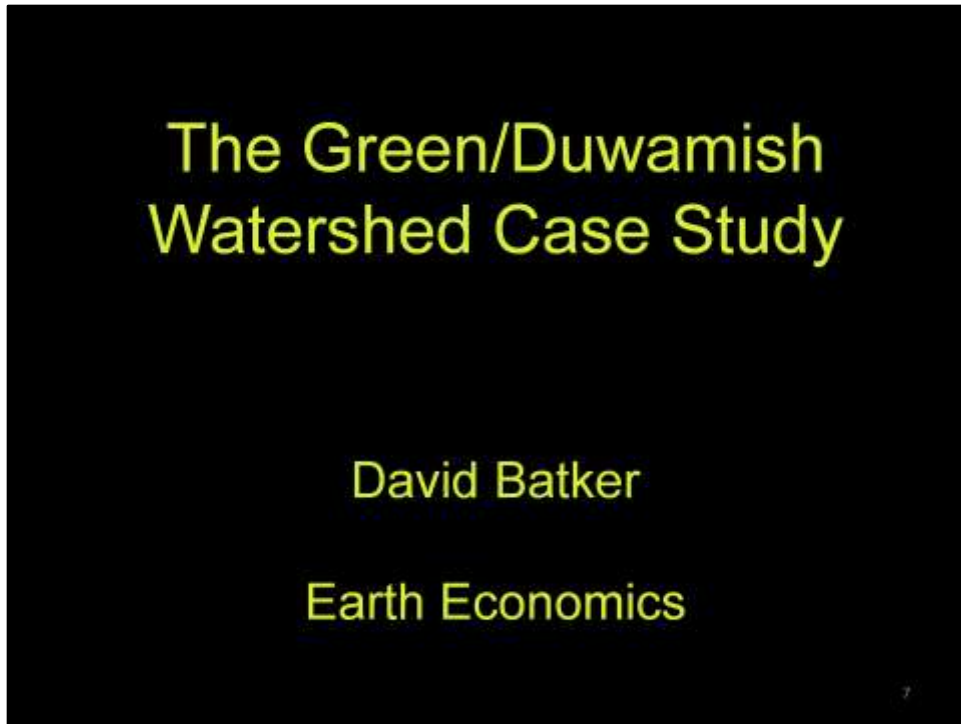
- This slide lists the incentives we have created to encourage investment.
- The fundamental point is that these ideas are not a small boutique notions that are experimental. We have over twenty years of experience with them and they are being applied to a lot of environmental problems.



- On to my second point about jargon - this is my attempt to boil it down.
- In every case there is a “limit” which can be referred to as a “cap,” “maximum daily load,” etc.
- There is always a unit or measure.
- There is always a specific geography.
- There is always a transfer of legal liability.
- These elements exist in all market mechanisms. They are the basic elements; when you see this pattern, you can recognize it as a market solution. People attempt to call them by different names, which is where we get additional terms and increased confusion.



- My last point is that you will hear a lot about market mechanisms in comparison to payment for ecosystem services (PES) programs. The two are very similar but the fundamental difference lies in where the money comes from.
- In private institutions, you have private investments that create scientifically verified ecological uplift that offers a compliance credit.
- Other side, public spending is applied to public priorities.
- ES are adding a unit of measure, essentially creating discipline of what we measure, which did not exist before. Now there is a shared infrastructure of metrics and accountability which is applied in compliance and helps enable offsets and oversees the way we use public funds to support public priorities.
- In both cases, we are using the science of ES to tell us how to evaluate our spending and allows us to be more accountable.

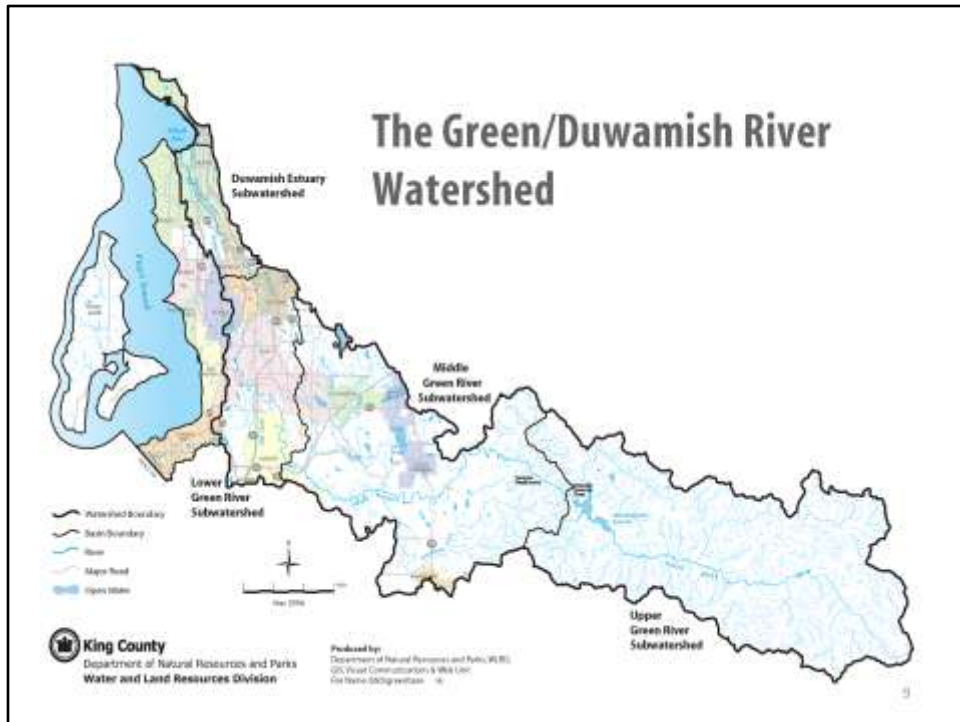


Mr. David Batker

- To add to Adam's point, a lot of times we look at the scope and scale of a project, which may not be sufficient to accomplish your goals. Usually, it takes more than one market to accomplish your goals.



- This is a map of the Green River watershed in Washington state. As a quick overview:
 - It has the most industry in the state (\$100 billion); it is where Boeing is based.
 - 600,000 people live in the region
 - There are 16 cities with 16 different storm water districts
 - There are multiple flood districts that have since merged into one
 - It is an important area for Chinook Salmon
 - There is a lot of privately owned timber land
 - Most of the Farmland is in King County
 - It gets very urban and industrialized out by Seattle
- Some of the problems facing the region include:
 - Flooding, storm water, wetland, transfer of development rights, and each have their own unique mitigation methods



- In this first case, we focused on salmon. We realized that you could not effectively conduct stream restoration for these salmon unless you invested \$300 million, which is well over what we could get from typical sources. We started looking at markets and PES and brought 16 cities together over five years.
- We did valuation of ES in the watershed and showed there was somewhere between \$40 billion and \$200 billion in value provided by the surrounding forest. For this valuation, we used a simple benefit transfer approach, which put a wide mark and showed that yes there is a lot of value!
- Then we explored 25 different funding mechanisms, one of which being wetland mitigation banking.
- In working with 16 cities, we realized that there is no one jurisdiction that can actually implement the restoration and coordination necessary for this type of initiative.
- There are over 150 tax districts in this watershed. We were able to get them all together by merging some tax districts and setting up infrastructure to improve salmon populations while increasing property values and water quality.
- Finally, we realized we needed one last tax district. A lot of cities knew they could not handle storm water, etc. If you are a flood district, you cannot pay for the margin to recharge ground water. So, we considered taking a system approach and the group voted unanimously that this type of approach was the best. We do also have a trading approach that is being used in many places like Eugene. Eugene is another example of where we are also working.
- This is all about physical problems: physical stops and flows that need to be changed. Our society has a set of solutions, but the way we allocate is based on financial flows, stocks, and expectations. Whether investment comes from investments firms or from government, they all have different mechanisms and expectations.

- Next, I will jump to discuss some national work with Seattle, Tacoma, San Francisco and New York and smaller utilities. The seller is not the problem; plenty of people want to do this. It is the buyers who have the issue.

➤ Why is this the case?

- Our accounting structure does not support the right incentives, they are omitted from your asset sheet.
- The cities I mentioned all have forest-filtered water. Seattle avoids \$200 million in filtration costs because they use the forest to do it naturally. On the other hand, they all have to make investments in those watersheds. For instance, Tacoma wants to pay farm owners to change the ways in which they manage their lands to preserve water quality. You cannot take a bond out for water filtration, but if you take out a road to reduce runoff, it is a write down. What bank will give a loan for that? None will; we need to change this kind of accounting. Producing or filtering water saves companies lots of money, but it is not reflected on their balance sheets.
- We need to change accounting rules if we are going to make any headway with this. We want to start with the biggest issue and water is the best. We can bring together the clout to change accounting rules. This will change in the next five years, hopefully, and it will affect all federal agencies, private landowners, timber companies, etc.
- Right now, ES do not count in the Army Corps of Engineers' cost-benefit analysis, but they are considering making changes. This would be a sweeping change that would be absolutely crucial. It would probably mean we could overlap \$100 million dollars for the salmon restoration project. It would also mean transactions between all sectors.
- Because it has the aspects of merging tax districts, which Republicans like, and actually doing restoration, which Democrats like, it seems likely to happen.
- You always want to find the case where you can show a trade where someone is going to make money.

➤ Where is it going to work well?

- An established market, like electronic-waste is easy to work with. Establishing a new market is really difficult.

- We are working with FEMA who is guaranteed money every year. They have one tool for everything, no matter what the disaster: flood, hurricane, tornado, earthquake, etc. You go online and put in your claim and then they decide what loan you get. Now FEMA wants to incorporate ES into this framework, which is important because people can move out of the floodplain. This will be the first time we offer these sorts of values to change their cost-benefit analysis, and it is a simple appraising and benefit transfer approach that fits well with FEMA's model.
- Now we are thinking about a comprehensive solution to an entire watershed system.

Audience Questions:

Participant

- You talked about bringing all agencies together and that is what seems hard to get. What did you do to get them to agree and come together?

Dave Batker

- The Water Resource Inventory Area (WRAI) region 9 (Green River Watershed Region) got all the cities to come together and had a steering committee of 70 people. They were not used to unanimous decisions and a few important things happened to get it. There is nothing like sealing a deal to make things go forward. We did an analysis to calculate flood protection instead of salmon restoration and they loved it and realized that maybe they could look at ES. They voted unanimously and recognized they were on the same page, which helped things move forward.

Participant

- When you mentioned \$40-200 billion in value for this particular watershed, did you mean annual or present value?

Dave Batker

- We used two values. First, we calculated the ES value and then we annualized it and calculated back to get the asset value. Again, it is an appraisal approach. Natural capital appreciates, and is something the business community can grasp and love, while built capital will degrade and fall apart.



Dr. Ben Guillon

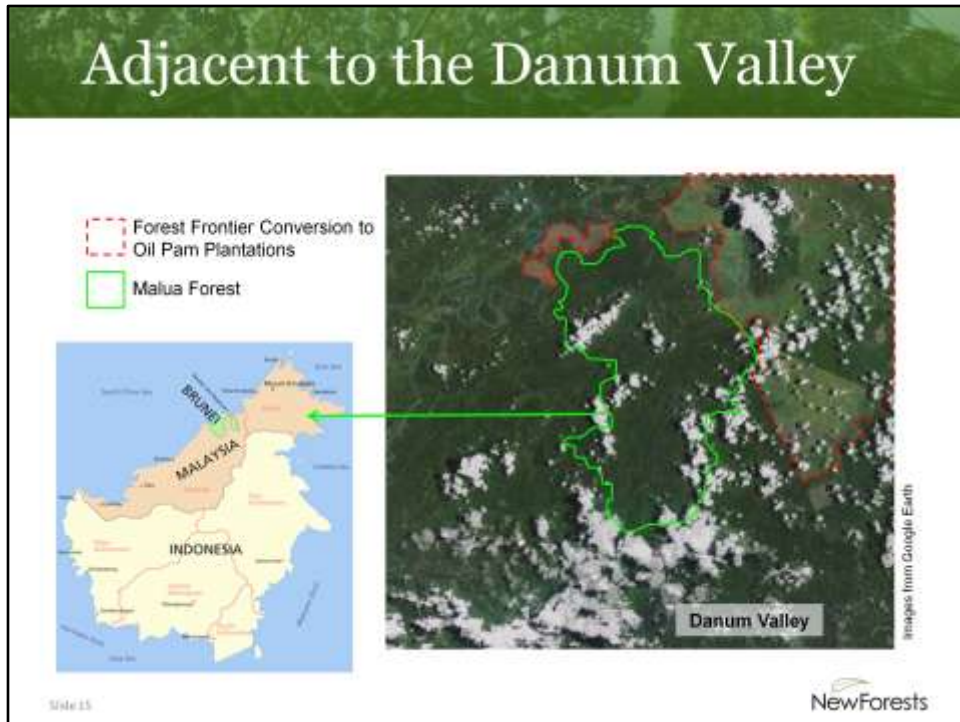
- Before we begin, I would like to give you a bit of context on New Forests. It was funded in 2005 and we now have 30 staff members in three offices: Sydney, Singapore, and San Francisco.
- We are a financial management firm that focuses on ES. We have many investors; our main investor is Generation Investment Management, the company funded by Al Gore.
- New Forests has land totaling the size of Rhode Island, approximately, and over \$1 billion in assets and management. We raised \$50 million for mitigation banking and forest carbon.
- I started in the field and moved to the World Bank to work on ES. When I saw this project with New Forests, I decided I wanted to try it for real. I manage the funds on the financial side.
- We make judgments based on information we have and then we adapt as information and the world changes.
- We developed this particular project in 2008 and then the world changed. This is really an issue when a project is based on markets.

Important Note

The information contained in this presentation includes financial and business projections that are based on a large number of assumptions, any one of which could prove to be significantly inaccurate. This presentation does not represent an offer of any securities or of any investment. It does not represent financial product advice.



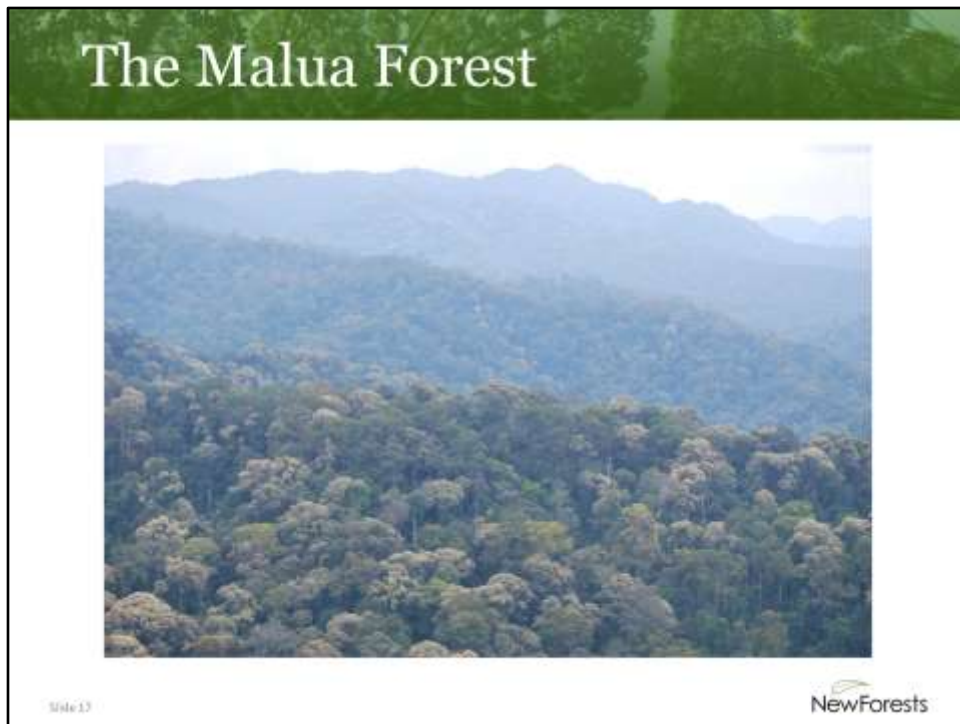
- Originally, this project was based on an alignment of stars. The palm oil industry came together in a roundtable to think about how to green the palm oil supply. On the other side, the government, who had logged most of the forest and realized there was no future, was looking for a paradigm shift to make money on forest without cutting it.
- New Forests worked with Forest Trends and their program for biodiversity offsets. We tried to apply what we learned in the USA to these particular issues. We decided to focus on palm oil.
- The roundtable on sustainable palm oil allows you to be certified but you cannot be on plantations of certain types. New Forests would provide them with the voluntary tool that mimicked USA mitigation banking to provide offsets over two years. The framework we used in this case is very similar to that of wetland mitigation in the USA.
- We picked the Malau Forest Reserve.



- The Malau Forest Reserve is on the eastern side of Saba.
- Green represents the Malua Forest Reserve.
- Red shows where palm oil is located.
- Once the area is logged, the only way to make money is palm oil.



- In this picture, you can really see the border of the reserve and how palm oil plantations are built right up against it. It shows how palm oil is really encroaching on the forest reserve.
- The reserve encompasses 34,000 hectares. We found this size to be manageable while still providing enough space to have an ecological impact.
- There is an abundance of species, many of which are rare, such as rhinos, elephants, gibbons. Many species have been pushed from other places because of human population expansion.
- The government said no logging for 50 years, so we have that much time to produce results. Government is responsible for anti-poaching activities.
- New Forests is providing \$10 million for restoration and is responsible for the marketing and selling of credits, either Reducing Emissions from Deforestation and Forest Degradation (REDD) or biodiversity credits. We chose to focus on biodiversity.
- It is a for-profit venture in which 20% of profits will be managed by a third party and reinvested to incentivize government to support the protected area after 50 years. The rest of the profits are split evenly between the government and New Forests.
- In mimicking the mitigation system, we took a bundled approach rather than go into functions and get too complicated. We defined a credit to be a 10 by 10 hectare and whatever services are provided within it. The exact methodology is still in development, but we created an advisory committee with local NGOs, government officials, etc. We selected people who felt they knew and owned the territory in order to solicit buy-in and get everyone comfortable with the idea.



- Now, three years later, it is not what we expected. But we have had great conservation success: we stopped poaching, there is a rhino in the forest who is one of only 40 left.
- It was hard to find an agreement on the conservation objectives. Some wanted a wilderness concept while others just wanted to increase the capacity despite the original density. It took a while to get everyone on the same page.
- Of course the financial market had a significant impact on the project. The price of palm oil crashed 50%. The big companies were working with us because they were only interested in greening to obtain the premium price. After the market crashed, the premium no longer existed in the same respect.
- The fund was growing at a much lower pace than we wanted so we switched from targeting the supplier to targeting the buyers, i.e., Este Lauder. Greenpeace had independently come down pretty hard on those companies so it was easy to open doors with them.
- We have also worked with social media. In two months, you will see a new website where you can buy the credits online. We are engaging with Zynga to integrate the credits with games like FarmVille. We also created a partnership with a food company to provide a redemption coupon on a food box. Consumers could redeem the code for cash or use it to buy biodiversity credits. More than 20% of people who redeemed the code from the box chose to buy the credit over receiving money back, which was an interesting success.
- When you have a voluntary market and want to switch to a compliance market, it takes lots of time and we are still working on it.



- I would like to repeat three points to conclude:
 1. We have learned a lot from this project. Using the mitigation experiences from the USA was a great thing. It helped us establish a track record and helped us gain confidence and trust with the Malaysian government. We have learned how it is important to start simple, which may not be the best solution from an ecological perspective, but the bundled approach is must easier to communicate and manage. Transparency was also really important . Even if the science was not really sound, we were very clear and open; we put everything on the website so all partners were able to access everything.
 2. It is important to determine who is going to buy credits. What are the drivers? You need to have methodologies in place and agreed-upon goals, criteria, and indicators before you start. This will help when you get going and discuss indicators. This example really had a spectrum of voluntary and compliance based mechanisms for a lot of transnational industries. Self-regulation can be an option, but it is not the best. When industry can see the benefit, they can set the standards really quickly. The roundtable is effective if all partners are engaged.
 3. Picking the right financing is crucial and I am not sure we have found it yet. We did not use the full spectrum. Our investors in the company and the institutions that gave us money are not patient and expect returns quickly. It is hard to create a new market with private equity capital; it is not the best use.

- From now on, we will work in three steps:
 1. Might be wise to first start with a grant to get a roundtable going and make sure participants are willing before moving to develop methodologies. Grants are important here because we need to assess all important players. Indigenous people may not be the focus of private investors like they would be for NGOs or foundations.
 2. Next step is to start a pilot project. The risk is such that there is a need for incentives. Maybe guarantees, etc., these are ways to promote early development of pilots.
 3. Once you have showed that the pilot works then you can raise private equity capital. Once the concept is proven, getting capital is not really an issue.

Audience Questions:

Participant

- Your revenue stream is several types of credits correct?

Ben Guillon

- Exactly, now we have moved to focus on biodiversity but with the idea to develop REDD in the future. The issue working in Malaysia is that they have delegated management of forests to the states. It is complicated and you need the national and state levels to talk.

Participant

- It is tough to compete with palm oil? Have you compared how your revenue streams compare to that of palm oil plantations?

Ben Guillon

- Currently the only people who have logged credits are global business men. We are still in the concept stage and are trying to change the way we approach the market. Palm oil is so productive that even if you attach a small premium it will present a lot of money. You can really translate that and we think it is highly competitive.

Participant

- What are the substitutes for palm oil?

Ben Guillon

- We are not trying to substitute palm oil. We are trying to increase green palm oil. If you look at productivity, palm oil is way more productive than its alternatives, which would need more land if you were to stop palm oil. Good palm oil is not that bad. Biodiversity on the plantation is zero; it is not perfect, but it is what you need.

Participant

- This is a mitigation plan? Are palm oil producers required to pay into the bank?

Ben Guillon

- Originally, yes if they wanted to be certified. The thing is that the methodology is not that well defined. We do not want people far away to buy credits. This is why Forest Trends would work. We are competing for the use of land with palm oil. Palm oil or something else which could be sustainable forest management. All the very valuable trees have been removed. There is no low-impact logging, which is why biodiversity credits were appealing.



Mr. Ricardo Bayon



- This is a fascinating picture of the earth that I want to share with all of you. The white lines are air routes, the blue lines are boat routes, and the green lines are roads. Together, it looks like we have covered the planet with a network of spider webs. What captivates me in this picture are the dark spots.
 - Why do the dark spots not have value? What kind of value do they have?
 - How do you attach value to them? Do you send out an economist to do it?
- Think about coffee, you do not ask an economist to assess the value of your morning cup? There is an appraisal stage, but the market sets the actual price.
- We have sent economists to the dark spots and they tell us how much it is worth, which helps to get people moving and thinking.
 - But how do we get the numbers to make markets and really get values?
- I do think markets will be a way we do that. Government will have to set limits on a public goods and start trading.
- Scarcity is also really important; it is what drives value. Even in a private market where a company sells to another somewhere else. Scarcity value is created by the government setting those limits.
- The problem is that we are running on outdated software in our economic system. It was created at a time when capital and labor was scarce not natural resources. At the time, we wanted to get rid of our resources; the system was created for a market about labor. We live in a different world where the demand for ES is increasing and we no longer have an abundance of resources. There needs to be a flip. This is why we created our investment firm in 2008; because we knew that this flip was coming.

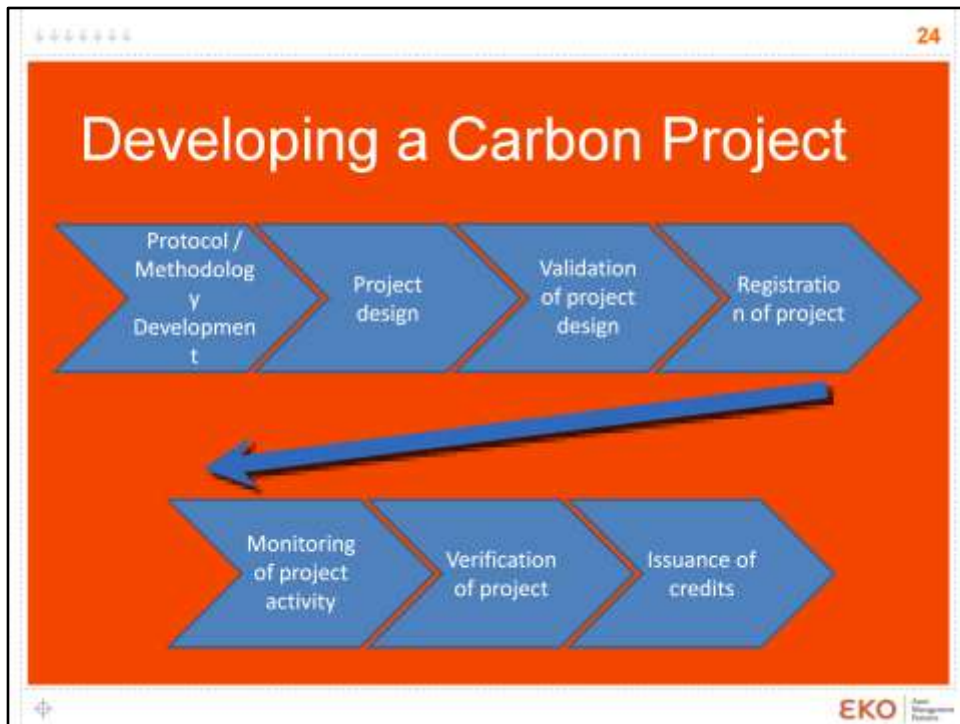


- This project takes place in Rondônia, Brazil. In the images above, the area in red represents deforested from soybean agriculture while the green shows the indigenous territory. The Surui people have about 240,000 hectares involved in this transaction.
- The community of more than 1,000 people decided that they wanted to take advantage of carbon markets to protect the forest and offer survival alternatives.
- Along with Forest Trends, I have been working on ways they can enter into carbon markets.

➤ Where is the demand?

- Right now, there is a huge carbon market in Europe but it does not allow forest carbon. Most of the \$100 billion that is traded are allowances. Clean Development Mechanism (CDM) has not allowed REDD, but they started talking about it five or six years ago, so maybe it will happen in a few years.
- Voluntary carbon markets are hard to categorize and is not huge. Nearly \$400 million/year is traded in voluntary carbon transactions, the majority of which come from REDD. Largely because we have methodologies for it, we believe that Europe will let it in at some point.
- Also, California (with AB32) has talked about letting REDD into their markets. Eventually it will happen, but is unlikely to occur before 2015.
- Surui are using voluntary markets. We are using the REDD framework to establish their own measurements through the voluntary carbon standard (VCS). It is new since it was applied in July.
- VCS looks at what is on the land at present time to get a baseline. Then they model what will happen if you do not continue with a project, i.e., how will it change a landscape and

- affect carbon emissions, etc. They also look at what will happen if the project continues, if you protect the land – many variations. Then you compare the scenarios. The carbon credits are the difference between what would happen and what will. ^{9/14/2011}
- What would happen involves some very complex equations. You get into issues with additionality, etc. And it is complicated to get this info; it requires a PhD to go through formulas. Once you register the credit, you can sell it. Then it is verified and monitored by the third party to make sure what you said will happen actually happens.



- The diagram above is a representation of the process behind creating a plan of this type. It takes a lot of time and money (\$100's of thousands). The project design stage often costs \$30,000-50,000. The verifying stage will run about \$30,000-100,000.
- We have been working with the people of Surui for three years and the communities are wondering if it is real and if they will ever see a profit. You can sell a project before it is registered, but you will sell it for less. It is governed by risk and reward.
- There are two fundamental human characteristics that drive business: greed and fear, which we call risk and reward. This is true for environmental markets as well. In the carbon market, the bigger the risk, the greater reward we expect at the end of the day.
- We are trying to come in with capital now, before registration and make this project more viable and keep the communities engaged. But then who will buy? We have investors on the voluntary side. We anticipate that Europe will put this on the market so we will buy now, but at a lower price.
- Until there is a real market for forest carbon, all we have is the voluntary market. The voluntary market is something, but it is not big enough.
- At EkoAsset, we get five or six REDD projects every week. Of them, we can discount 2/3 because they are poorly done. Of the remaining, some are too big; they involve millions of hectares. The big question is whether there will be a supply and demand mismatch at some point. We think yes, there will be.
- Eventually, if the timing is wrong, it will be tricky to execute a project like this. We are looking at this project, because we know where the buyers are. Other thing, is the money available to support this project has allowed it to come to this stage.

Audience Questions:

Participant

- Are the methodologies you use repeatable?

Ricardo Bayon

- They are repeatable, and you can take them from other projects, but if you need to create your own, it is costly. Now the laws are such that one can get royalty payments from their methodologies. People were being too specific so a royalty system was set up to allow more sharing.

Participant

- My sense is that the demand is decreasing as the political climate is more uncertain, is that true?

Ricardo Bayon

- Not sure I would totally characterize it that way. People are raising significant funds for REDD because people think Europe will allow forest carbon. Also question of California and what they will do.
- Next week there is a big meeting in Borneo that will look at all of this.

Galileo Galilei

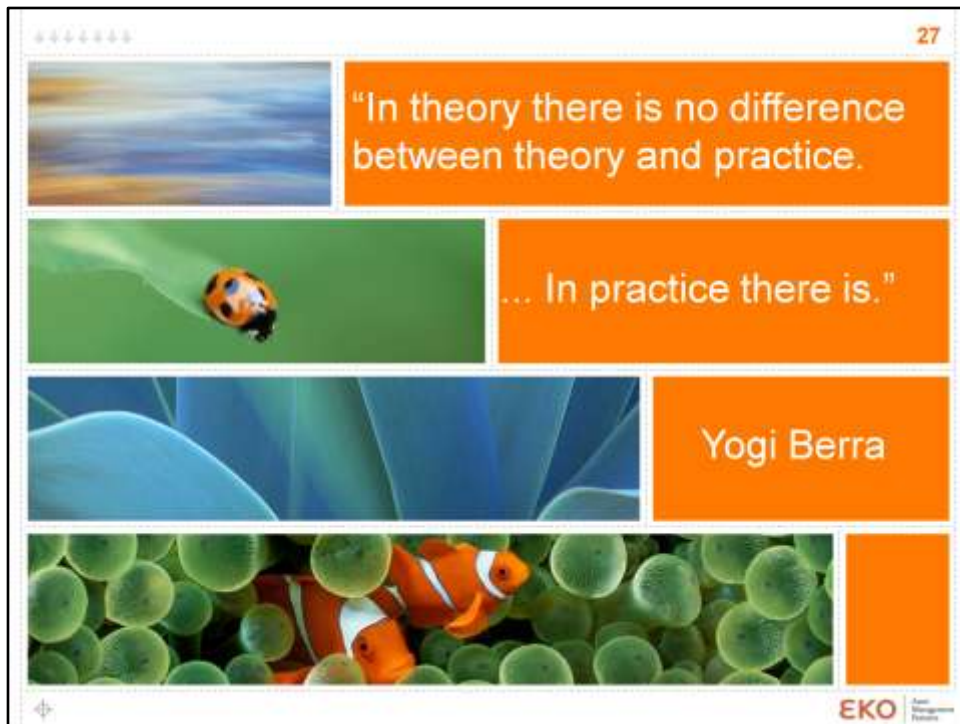
• "What greater stupidity can be imagined than calling jewels, silver, and gold 'precious' and earth and soil 'base'? People who do this ought to remember that if there were a greater scarcity of soil as of jewels or precious metals, there would not be a prince who would not spend a bushel of diamonds... to have enough soil to plant a jasmine in a little pot, or to sow an orange seed and watch it sprout, grow and produce its handsome leaves, its fragrant flowers, its fine fruit."

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EKO

The slide features a large orange background on the left containing the text. On the right, there are two images: a caterpillar on a green leaf and a cross-section of an orange. The slide is framed by a thin black border with navigation icons in the corners.

- The paradox of scarcity is not new!



- To conclude, know that it is hard to get these sorts of things going.

Audience Questions:

Participant

- Have you been in tune with what is going with the price of carbon in Australia and the way it affect credits?

Ricardo Bayon

- Australia has gone back and forth many times and now it is settling down. I do not think that it is affecting credits.
- What people are watching is the development in Brazil and China to create internal markets. Brazil, China, India, and Japan may all have carbon markets before the United States does. All together, it could aggregate up in terms of demand.

Participant

- There is an evolving domestic market in Brazil where REDD credits are the cheapest.

Ricardo Bayon

- Nested REDD is a big issue I did not address. You cannot look at the project level because deforestation can just move to a diff area. You need to look at a bigger scale, at the state, province, region, etc. From a private perspective this is a very risky affair. That kind of risk is a bridge too far and how we deal with it will be huge.

Participant

- If the Wal-Marts of the world, regulatory regulation aside, are all interested in more sustainable practices and define more sustainable sources of soy or palm oil by including carbon credits, how credible do you think that could be?

Ricardo Bayon

- I think that is a credible way to do things. Integrating carbon into the supply chain is another way this can be incorporated and demand can increase. It could be very powerful.



Seminar 5 Discussion Synthesis

September 14, 2011

This document is a synthesis of important topics and questions discussed during the question and answer and discussion period immediately following the panelists' presentations. Please keep in the mind that the following is only a recap and speaker identities have been removed, except for those of the panelists. We hope that the following notes and discussion questions will be used as resource to advance further discussions about ecosystem services.

Below you will find a summary to specific key questions and topics covered during the seminar discussion.

Question 1

To follow up on the idea of leakage and determining the balance for market activity and permits, what is the appropriate balance between scientific rigor and market activity?

MR. BATKER

- On one hand, we have physical stops and flows and on the other, we have financial stops and flows. We now have a plethora of methodologies and ways to measure ecosystem services, which is good. We are getting a better handle on the physical changes. On the other hand, we have nothing to bolt on that connects the physical changes to the financial world.
- We have developed a database for ecosystem services calculations. We should at least look at it to get an idea on how to form a market on the financial side. For instance, Eugene Water and Electric will take values, look at a range, and figure out where to spilt consumer surplus.
- We need to look at the way we make decisions in standard markets, that will lead us forward. In standard markets, we use appraisals. There are many criticisms for using appraisals but they are a quick benefit transfer. We need a way to get marginal physical changes to have value financially; we need connection. We need this at scale; a web-based tool that can allow for some set of values that can be plugged into a financial framework.

Question 2

What is the most likely way to get the connection to financial value to happen at a large scale?

MR. BATKER

- We want a web-based tool that investors can use. They can look at it, take the information, and incorporate into their pro forma.

MR. BAYON

- I sometimes worry about having too much valuation because if you do not have someone willing to pay, the valuation does not mean much. The real value is if someone, Federal Emergency Management Agency (FEMA) etc., can commit to whatever amount. That is really where a market, as oppose to a valuation study, is stronger. There is a saying, "if you line all economists end to end, they would not reach a conclusion." There is a lot of debate and theory, but unless it actually happens, what is it worth?
- Going back to Adam's question – this is a critical point. It is hard to know when there is enough science. You can know when there is too much, which shocks scientists who want 99.99999% certainty. The issue is that when you wait to get that level of certainty, we miss the opportunities. You can also know when you have too little science. People want certainty and updated numbers but there is a balance; it is a kind of Goldilocks zone.

MR. BATKER

- Wal-Mart is accustomed to driving prices down. When you can show the value gained at each step in the chain for a product, then you can say that someone will pay more because it can increase the profit on product X. You have to lay out a path within the product for the purchaser to show greater profit.



DR. GUILLON

- People always see profit as bad. Either you are able to explain why it is not bad and explain why it makes sense to public or you are out. We need the science to get people on board but we also need the market to be simple so people understand it. Mitigation banking is getting into complicated modeling. On one side, you need to connect to the public, but the landowners cannot complete it themselves; they need the funds to hire consultants to do it for them. What does a farmer do when they take out a loan and the project does not move? They need help to market themselves.

PARTICIPANT

- The comments about appraisal are interesting. Appraisals are not perfect, but you at least have the ability to go to appraiser and say, "I want to look at comparables." At least there is transparency and you can negotiate with the seller. I like this because you can pull the curtain back and negotiate. Keeping the transaction cost low is important or the person will not sell.

MR. BATKER

- Exactly right! Exxon purchased Mobile and in the process, the appraisals were different, but they negotiated and came to a conclusion. All markets are different and have different standards. For FEMA, it does not matter how or where you lost water, they compensate everyone, no matter the circumstance, US \$46/day. FEMA's valuation is the same no matter what, which may not be accurate, but it is what they do. Keeping in line with this, we are trying to fit FEMA's model and increase that value by 15%, which is huge! We know we cannot influence what they do and how they do it, but we think we can work with them to improve how they do what they do.

MR. BAYON

- To add to the idea of comparables - That is exactly what we need and what we are trying to do. We trying to generate more comparables.

MR. DAVIS

- This is why the wetland law in the U.S. is valuable, even if it is archaic. The law has over 20 years of history and examples. They are public records that are more or less accessible. It is a working model and as imperfect as it is, it provides those comparables, which are important.

MR. BAYON

- The value of a pilot study is going to be its future as a comparable.

Question 3

Adam and David – One of the goals people have around ecosystem services is to redirect the trajectory around activities. We do not want to just allow development to occur wherever. We want to be able to say watershed A has higher value than watershed B, so do not develop watershed A. Is that taking place in the mitigation paradigm? How do you get to where you redirect the frame?

MR. BATKER

- From our perspective, land use drives all. How do you map ecosystem services on the landscape? You start laying the maps of flood protection, endangered species, storm water, etc., and their values. Each has a map of provisioning benefits. For instance, flood protection is localized while carbon is all over the place. Once that is all laid out, then you can begin to utilize it for land use planning. We are starting to work this way with FEMA. How can you bill and reward based on ecosystem services? The three dimensional map is the impairer: who damaged what? Once you determine who is responsible, then they can pay for it.

MR. DAVIS

- In wetlands markets in the United States, there are two fundamental price signals: 1) a new form of value and 2) price discovery for the damager. Prior to mitigation banking, people would get permits by paying a fee (less than the actual cost) or doing it themselves. Incentive was not great. Now, permits in this new world represent actual cost and incentivize avoidance. As a result, more is happening. Now, the typical exchange is two to three acres of wetland protected for each acre destroyed. What we get in return is



more real protection for something that should be happening anyway. In mitigation, you are moving value, potentially from one place that was not very valuable in the first place. The Mojave energy plan has learned nothing of what we have talked about today and as a result, it is not working. We do not know everything, but we do know some things.

MR. BAYON

- In the United States, you informally do get some thinking and government encouraging places for best mitigation. In Australia, they provide their input/incentives based on a ranking system and have green, red, and yellow areas.

DR. GUILLON

- All the people in wetland and carbon mitigation banking know that you cannot make a wetland impact unless you have looked at 20 other ways. The issue now is not about restoring places to exactly what we had before, it is more about what the most valuable places are, where they are, and how we can protect and restore them.

Question 4

If the ultimate desire is to incorporate true costs into decision-making, we will need regulatory interventions, which set the framework and ground rules for markets. It will also need to be on a global scale to account for leakages. Do you have a point of view on the best and fastest pathway to do this? Is it creating a body of projects with empirical evidence? Is it working with for-profit entities, despite the increased risk, because results and adaptations happen much faster? Or is a combination?

MR. BAYON

- I would say all of the above.

DR. GUILLON

- What you describe is a main issue. You have to get the right players involved early.

MR. BATKER

- It is all three. Policy should focus on policy and rewards. In San Francisco, the chief operating officer is committed, which opens up new avenues for new buyers.
- What is going to pop the cork for wetland finance, enable all of this, and start moving lots of money? We brought many financial officers together who did not know each other and then they realized the watershed was their main asset. When they realized this, they could not understand why they did not see it on their books. How we look at accounting is important to this discussion. Right now no one can write anything about carbon, which the exception of those in Europe. This matters enormously. If a company can show that the river is its asset, then the company can borrow against it. This will begin to move large amounts of money through that asset.

MR. DAVIS

- Great question. How do you move first? If this is it, what is the tactic? Accounting rules are important, but there is also a standoff between policy and finance. Policy has scarce capital right now, both financial and political capital. In the end, the government does not know if it is worth its time. On the financial side, investors want to know that this is not a fad. They need to know the government is serious before they do anything, so there is a real standoff.
- I bet all my chips that by showing a real return on investment, you can get more funds and give people a real reason to participate. Examples are emerging. In New Mexico, a state pension fund hired a consultant to tell them where to invest. The recommendation was to invest in
 - Timber;
 - Domestic Agriculture; and
 - Mitigation Banking.

In this scenario, mitigation banking is a very new recommendation! This example is quite profound.



MR. BAYON

- There are multiple leverage points. One of which is the accounting standard. If someone wants to invest in ecosystem services, what box does it go in? When the box is there, that will be huge.
- In Europe, they created a carbon market and it crashed the first year. The investors went to the government to get the market up and running because they wanted to earn their money back. That is an example of investors pushing policy. Once carbon had a value, it started showing up on their budgets. These things are mutually reinforcing. Having pilots and the corresponding enabling policy will be important.

Question 5

We do a lot with insurance companies. We are working with Driscoll's on water sustainability and the transfer from the local to the international scale. I am thinking about the FSC forestry model in terms of carbon and water. How do you get certification involved? If you can affect one area, you have the influence to affect other areas. Certification is something we think about, so how does it play?

MR. BAYON

- There are many certification standards out there: LEED, Life Cycle Initiative, etc. There is movement from Rainforest Alliance to incorporate more carbon. In Brazil, the Life Cycle Initiative is showing biodiversity footprints and how to compensate for negative effects. It is starting to happen but it is not at the level where consumers make the decision, in my opinion. The closest thing is Wal-Mart throwing its weight around in its supply chain.

MR. BATKER

- Let me tell you about our work in the spot prawn fishery. They did not end up going with certification, but it was a driver. For certification to work, those involved have to see that they will receive marginal value because of the certification. The producers were refugees from a collapsed fishery and realized they could get more value from crab pot fishing as opposed to trawling. They cared about sustainability of the fishery, but the certification did not matter because they could get more money fishing a different way without the certification.
- Another example is that of electronic waste. Legislation was involved and we started with a pledge to give recyclables to a certified recycler. The certified electronic recyclers really pushed and all of the sudden it went triple digits. In that case, certification worked because the certified businesses saw they could get more business and increase their margin.

MR. DAVIS

- In the wind industry, there is a hybrid world of free compliance. The industry set a goal of providing 20% of America's electricity in a given amount of time. This will require over 20 million acres devoted to wind. If they do this, they will inevitably cause a listing of the lesser prairie chicken. They know this is a real possibility so they are trying to develop a certification standard based on best practices for site selection and operations that will also allow their sites to be grandfathered in as preexisting down the road. To do this, they are working with the Department of Fish and Game. Hybrids are developing.

DR. GUILLON

- How do you explain the value to consumers? You need to explain that you are selling environmental health in a way that justifies the premium. As an international finance corporation, we do it because we are investors but that is not true for the public. Once you demonstrate that the producer could get premium, then the demand for certification will increase. Organics may not last forever, but Fair Trade has a future because it offers (and secures) a premium. These things are all very difficult to convey to customers.

Question 6

The spot prawn is an interesting example of how to incorporate true cost. In effect, the fishermen can have more traps and still have no way to recognize the true cost of fishing. It all gets back to the security of that asset. We have all talked about mitigation banking and land use planning. In other resource areas, it is tricky; you have an issue of political will. How do you deal with it?

MR. BATKER

- Marine paradigm is incredible because it is so hard to tell what is there. You need lots more information on sustainability, economic efficiency, and fairness. You need to know general information about the stock of resources, show that fishermen can make a profit



by participating in certification, and a way to level the field. Individual Transfer Quotas (ITQs) can introduce the risk on monopolization if someone can afford to purchase all ITQs. For this, you need to define limits.

- There is really a great deal of creativity behind the spot prawn example. No one knows how many spot prawns exist, so how do you get the basic information about the asset? The spot prawn is an interesting creature: populations begin all male and then some become female, which adds an entirely new element to management. Canada came up with an interesting solution: when all females are gone, they close the fishery. This is a stock-independent fisheries model.
- Everyone who touched spot prawn made more money through their participation. It is a very specialized markets and not the solution for all shrimp fisheries but may be expandable. Every case is different and they all need case-by-case considerations.