

# U.S. National Opinion Survey on Stacking Environmental Credits

Definition, Status, and Predictions of Wetland, Species, Carbon, and Water  
Quality Credit Stacking





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*Definition, Status, and Predictions of  
Wetland, Species, Carbon and Water  
Quality Credit Stacking*

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## Abstract

This report summarizes and analyzes the responses of a national survey entitled “Evaluation of Credit Stacking” that was developed jointly by EPRI, the World Resources Institute, Stetson University College of Law and the University of Kentucky. The purpose of the survey was to collect opinions about credit stacking from practitioners currently involved in environmental credit markets. The survey was conducted in the first quarter of 2010 and was sent to approximately 1,500 individuals residing primarily in the United States. After verification and removal of duplicate inputs, responses were received from 309 individuals. Respondents were asked to identify themselves as credit sellers, researchers, policy-makers, credit buyers or credit exchangers. Ninety-four percent of respondents identified themselves as either credit sellers, researchers or policy-makers, and the responses from these groups were analyzed in depth.

Two survey questions elicited consensus responses. When asked to pick the best definition of credit stacking, 83.5% agreed that credit stacking means establishing more than one credit type on spatially overlapping areas, i.e., in the same acre. When asked whether their organizations were involved in or interested in getting involved in credit stacking, 73.6% said that they were.

Other questions in the survey dealt with the types of ecosystem credit banking and stacked credits with which respondents were involved or expected to become involved, the financial and ecological value of stacked credit projects, how ecological value was verified and respondents’ knowledge of existing and pending regulations or policy guidance. The survey also provided an opportunity for respondents to comment on some of the questions.

Key conclusions from the survey include:

- Credit stacking may result in positive ecological value, but the credit stacking scenario plays a large part in whether this value can be obtained, and there is little consensus on how these ecological benefits are being verified.

- There is also little consensus on existing or pending regulations or regulatory guidance. This is a reflection of the fact that there many different federal, state, and local agencies that may be involved in making and enforcing regulatory decisions.
- There is a clear need for regulatory guidance, clarity and consistency, and no clear means of achieving it.

**Keywords**

Credit stacking

Credit banking

Wetlands mitigation banking

Species banking

Water quality trading and carbon trading

Ecosystem services



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## Section 1: Introduction

Over the last several years, environmental credit markets that mitigate impacts to wetlands, endangered species, water quality and carbon emissions have been developed in many areas of the United States, and opportunities to engage in these markets continues to grow. These markets offer financial incentives for private landowners to protect and conserve natural resources, and the resulting credits can be a more effective method of mitigating impacts than technological, fee-based or single project approaches.

Allowing a conservation project to produce credits for multiple markets, commonly called “credit stacking”, has emerged with particular interest and is the subject of much debate. Most of this debate centers on how the stacked credits would be sold or transferred, the regulations that need to be developed to manage these transactions, and who should develop these regulations. Since there are multiple federal, state and local agencies involved or potentially involved, there is a critical need for straightforward, coordinated policies and regulations to ensure that environmental credit markets, including stacked credits, result in real, verifiable environmental mitigation.

EPRI conducted a national survey on environmental credit stacking in order to gather information on how this issue was viewed by various stakeholders and the levels of interest in credit stacking in the United States. The survey took place in early 2010 and over 300 responses were received.

This report presents the results of that survey. Section 2 provides an overview of the survey, including information on the survey logistics, the respondents, how the data was compiled, and a summary of the results. Sections 3, 4 and 5 discuss the responses of the three major respondent groups: credit sellers, researchers and policy-makers, respectively. Section 6 presents some overall conclusions that can be drawn from the survey. Appendix A contains the complete survey.








## Section 2: Survey Overview

### Survey Logistics



EPRI's survey on credit stacking was sent via e-mail to ~1,500 individuals, who used Survey Monkey to complete the survey in the first quarter of 2010.

A survey entitled “Evaluation of Credit Stacking” was developed jointly by EPRI, the World Resources Institute, Stetson University College of Law and the University of Kentucky. The survey was sent via e-mail to approximately 1,500 practitioners involved in markets for environmental credits. E-mail list serves and distributions lists were used including through United States Department of Agriculture Office of Ecosystem Markets, United States Forest Service Office of Ecosystem Services, the entire National Mitigation Banking Association, the Ecosystem Marketplace distribution list ([www.ecosystemmarketplace.com](http://www.ecosystemmarketplace.com)), and the National Ecosystem Service Research Partnership distribution list ([www.nicholasinstitute.duke.edu/ecosystem/nesp](http://www.nicholasinstitute.duke.edu/ecosystem/nesp)), as well as EPRI ecosystem services contact list. The survey was conducted electronically through Survey Monkey, an online survey tool and was open from January 12, 2010 through March 25, 2010. The complete survey can be found in Appendix A.

Respondents were asked to identify themselves as being primarily associated with for-profit, non-profit, government agency, academic or other types of organizations. They were also asked to specify their primary involvement in ecosystem markets as being credit banking/producing/selling, credit buying, policy-making, researching, or exchanging/brokering.

### Definition of Mitigation Credit Stacking

Each respondent was asked to choose the best definition of mitigation credit stacking. These choices and the responses chosen are shown in Table 2-1.

Over 83% of survey respondents agreed that the best definition for credit stacking is “establishing more than one credit type on spatially overlapped areas.”

Table 2-1  
Definition Choices for “Mitigation Credit Stacking”

Definition	Percentage of Respondents
Establishing more than one credit type on one piece of property, but not spatially overlapped	10%
Establishing more than one credit type on spatially overlapped areas, i.e., in the same acre	83.5%
Establishing credits on property that is publicly owned (National Park, Forest Service.)	0%
Establishing credits for a best management or conservation practice that was originally funded by the government (via grants, subsidies, payments, etc.)	1%
Other	5.5%

Respondents provided comments on the definition of credit stacking.

Respondents were also given the opportunity to comment on the various definitions of mitigation credit stacking. Some representative comments without attribution are shown below:

- “Stacking occurs when mitigation revenue is generated from more than one source for the same restoration action and used at the same time.”
- “The alignment of multiple individual resource conservation actions that when combined have an additive value toward restoring broader ecosystem functions. The key point is that each additional credit adds value.”
- “...the primary issue around stacking is additionality—that is, has the environmental benefit already been paid for somehow?”

Survey takers were electronically guided to specific sets of questions relevant to their particular type of involvement (credit sellers, credit buyers, policy makers, researchers, or credit exchanges/brokers). Each of these sets of questions was introduced with the text below and with the image shown in Figure 2-1.

“For purposes of this survey, **credit stacking** is defined as **establishing more than one credit on spatially overlapping areas**. Credit types include carbon, endangered species, water quality, and wetlands. Please see the image below for an example.”

The survey provided a working definition of credit stacking, illustrated by an example, that was also the consensus definition of the respondents: **credit stacking** is defined as **establishing more than one credit on spatially overlapping areas**. Credit types include carbon, endangered species, water quality, and wetlands.



Not Stacked (Spatially Distinct)		Stacked (Spatially Overlapped)
1 acre forest earning carbon credits	1 acre forest earning endangered species habitat credits	1 acre forest earning both carbon credits and endangered species habitat credits
 <p>One property</p> <p>Total Credits = 2 Total Acres Mitigated = 2</p>		 <p>One property</p> <p>Total Credits = 2 Total Acres Mitigated = 1</p>

Figure 2-1  
Example of Credit Stacking

### Respondent Self-identification

After verification and removal of duplicate inputs, 309 individual responses were received, which equates to an approximate 20% response rate. Self-identification based on involvement in ecosystem markets was distributed as shown in Table 2-2.

Table 2-2  
Respondent Self-Identification

Type of Involvement	Number	Percentage
Credit sellers	117	38%
Researchers	89	29%
Policy-makers	82	26%
Credit buyers	17	6%
Credit exchanges	4	1%

Respondents were asked to identify themselves as credit sellers, researchers, policy-makers, credit buyers or participants in credit exchanges. 93% identified themselves as sellers, researchers or policy-makers.

The study threshold for producing statistically valid results was a minimum of 30 responses in each category. Based on these responses, credit sellers, researchers and policy-makers were determined to represent statistically significant categories, and further analysis was conducted on these responses. The results of this analysis are discussed in the next three sections of this report. The responses for credit buyers and credit exchanges were dropped from further analysis due to a low response rate.



## Section 3: Credit Seller Responses

38% of respondents identified themselves as credit bankers/producers/sellers.

One hundred seventeen (38%) survey respondents identified themselves as a credit bank/producer/seller. For the purposes of this report, this group is referred to as credit sellers. In addition to the general question on defining mitigation credit stacking, this group was asked nine specific questions. These questions and their answers are discussed below.

### Sellers' Definition of Credit Stacking

As shown in Figure 3-1, this group defined mitigation credit stacking almost identically to the respondents as a whole, with only a slightly larger percentage agreeing with the consensus definition of establishing more than one credit type on spatially overlapping areas.

Credit sellers agreed with the consensus definition of mitigation credit stacking.

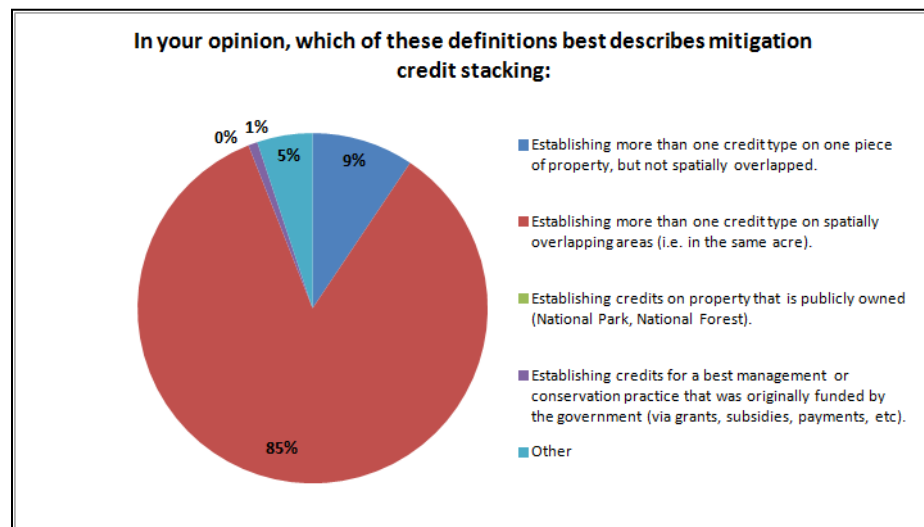


Figure 3-1  
*Seller Definitions of Mitigation Credit Stacking*

### Sellers' Involvement in Ecosystem Credit Banking and Credit Stacking

The next question asked respondents to identify the type(s) of ecosystem credit banking with which they are primarily associated: wetland, water quality, species, carbon or other. Their responses are shown in Figure 3-2.

Credit sellers are engaged in a many different types of ecosystem credit banking, with the most responses received for wetland habitat mitigation credits.

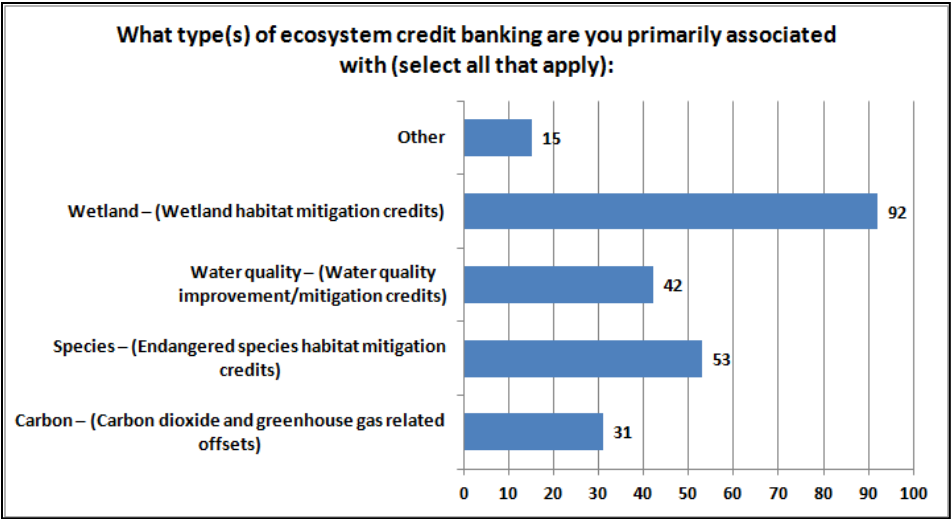


Figure 3-2  
*Seller Involvement in Different Types of Ecosystem Credit Banking*

The next question in the survey asked respondents whether their organization has been involved in producing, purchasing, trading or selling stacked credits. Their responses are shown in Figure 3-3.

Only one-third of credit sellers have been involved in credit stacking.

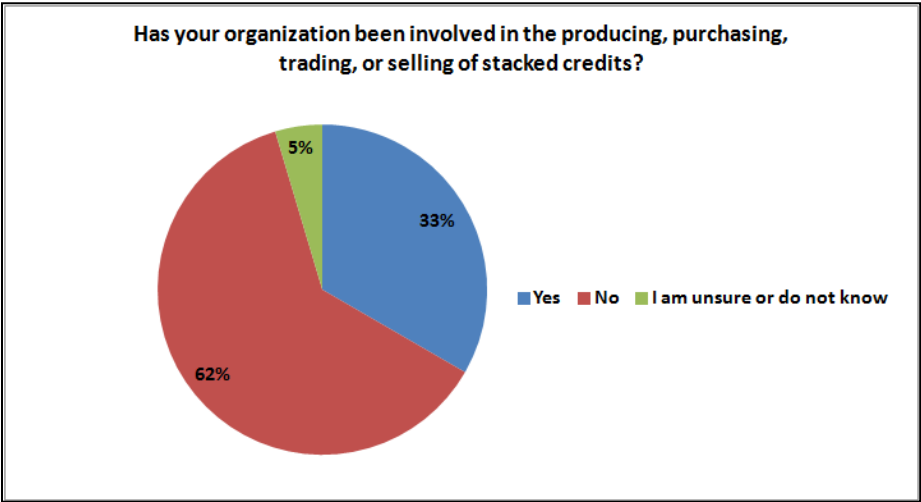


Figure 3-3  
*Seller Involvement with Stacked Credits*

### Number and Types of Credit Stacking Projects Sellers are Involved

The next two questions in the survey asked respondents to identify the number of projects involving stacked credits in which they’ve been involved, and the types of credits that are being stacked.

Of the roughly one-third of respondents whose organizations have been involved in credit stacking, the vast majority have only been involved in 1-2 projects. These responses are shown in Figure 3-4.

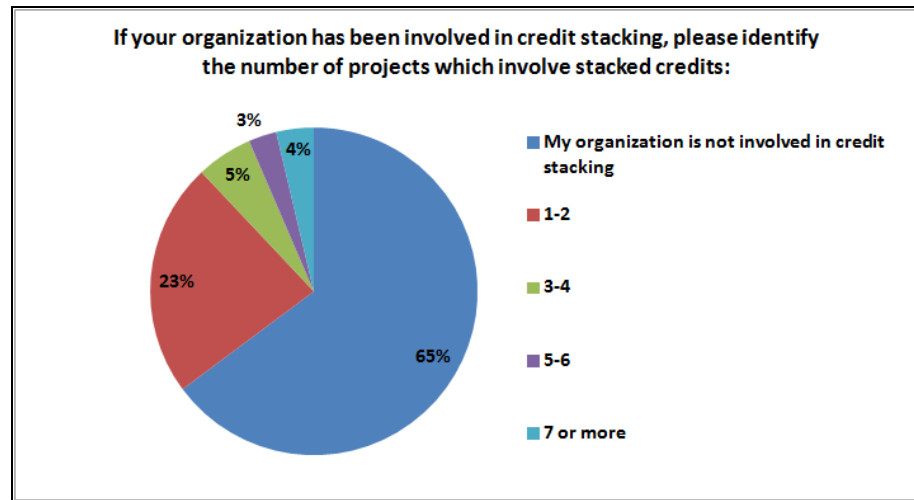


Figure 3-4  
Number of Seller Projects Involving Stacked Credits

The next question asked about the different sets of stacked credit types. The respondents were given a variety of combinations to choose from, with the two predominant combinations being Species & Wetland and Water Quality & Wetland, as shown in Figure 3-5.

Of those involved in credit stacking, the most common type of stacked credit was species and wetland.

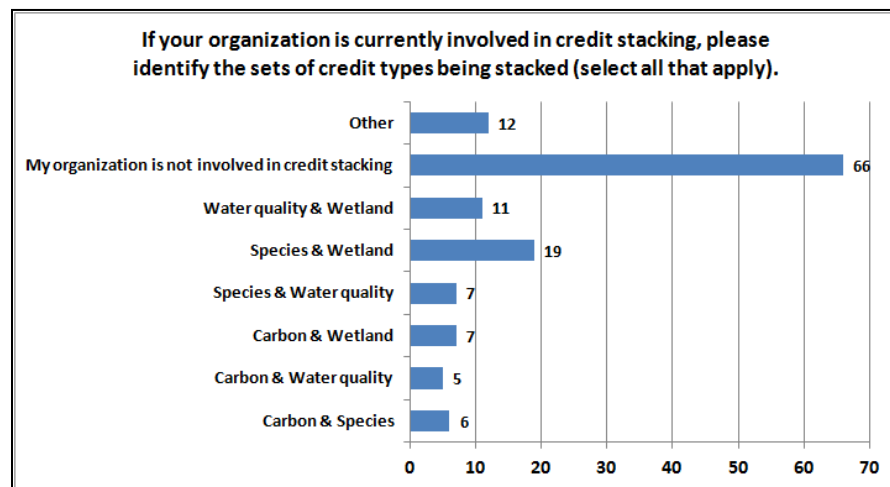


Figure 3-5  
Types of Credit Types Being Stacked by Sellers

### Sellers' Perceptions on the Value of Credit Stacking

The next three survey questions asked respondents to provide opinions about the financial value their organization has received from credit stacking, the perceived

ecological benefits from credit stacking over credit banks for only one type of credit, and how those benefits are verified.

### **Financial Value of Credit Stacking**

Approximately 70% of respondents whose organizations are involved in credit stacking believed that it increased the financial value of their projects, and no respondents believed that credit stacking had a negative financial value on their projects. These responses are shown in Figure 3-6.

Most sellers who are involved in credit stacking believe that stacking increased the financial value of their projects.

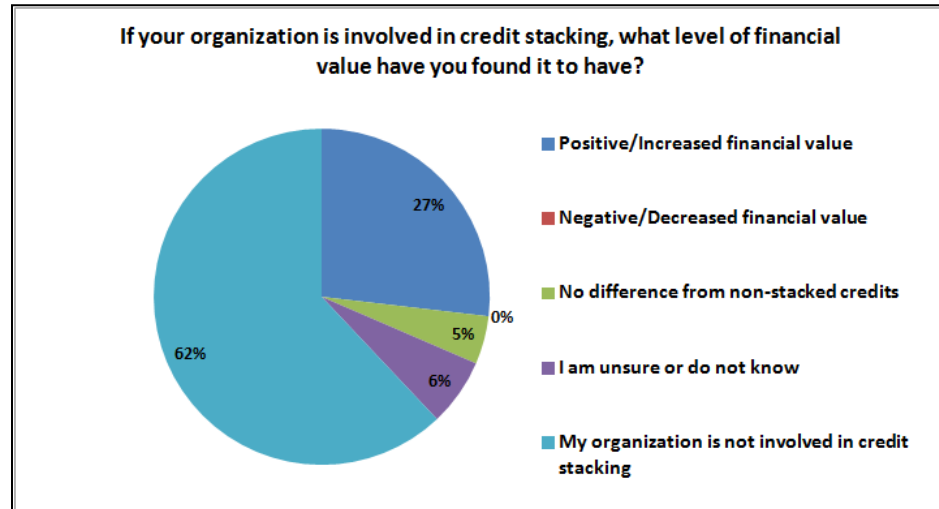


Figure 3-6  
Sellers' Perceived Financial Value from Credit Stacking

### **Ecological Value of Credit Stacking**

The answers to the question on the ecological value of credit stacking over establishing a bank for only one credit type resulted in a variety of opinions. Roughly half of the respondents believe that credit stacking would result in positive ecological value, which was defined by such criteria as increased habitat, improved water quality, reduced species risk and fewer climate impacts. Another 36% of the respondents believe that the ecological value was dependent on the credit stacking scenario, while 8% believed that credit stacking would result in negative impacts on habitat, water quality, species risk and climate. These responses are shown in Figure 4-7.



Over half of the sellers believe that credit stacking increased the ecological value of projects.

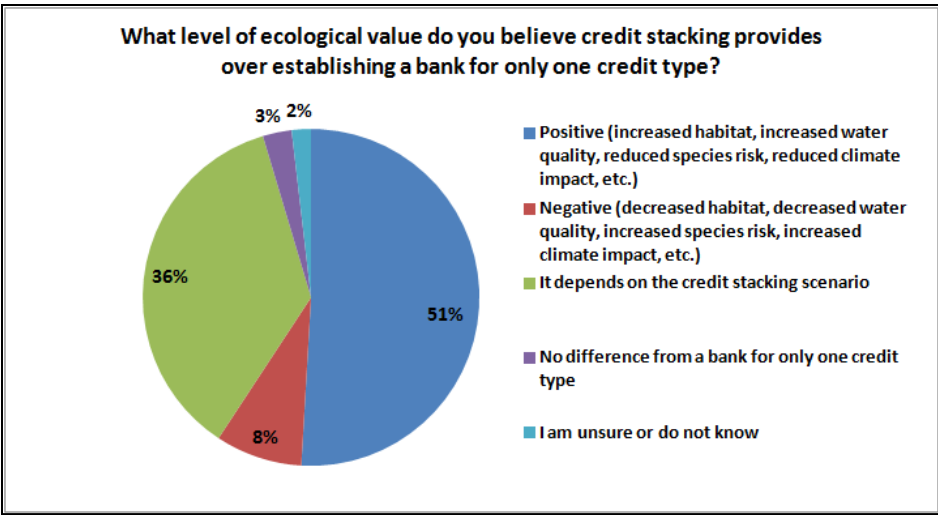


Figure 3-7  
Sellers' Perception of Ecological Value of Credit Stacking

### Seller's Comments on the Ecological Value of Credit Stacking

Some respondents who believed that credit stacking had a positive ecological impact also took the opportunity to explain or elaborate on their response. A few of these responses are shown below:

Many respondents also provided comments on the ecological value of credit stacking.

- "If we could overlap wetland banking with conservation banking, we could reintroduce threatened and endangered species. Without a financial stimulus we can't justify the increased cost and labor."
- "The additional income from credit stacking would allow me to conduct management activities to increase collateral non-market ecological values that I may not otherwise be able to afford."
- "It expands marketability of species credits and provides a more comprehensive solution than singular species credits."
- "Provides a better economic incentive to support ecologically valuable projects which otherwise might not get accomplished."
- "Many of these ecosystem credits have a synergy that enhances all values."

### Sellers' Understanding of How Additional Ecological Benefits are Verified

The third question on the value of credit stacking asked respondents to choose one or more ways in which the additional ecological benefits of credit stacking has been verified to the best of their knowledge. Many of the respondents were unsure or did not know, but there were also a significant number of respondents who cited other verification methods, with the largest number of respondents choosing regulatory approval and casual observation. These responses are shown in Figure 3-8.

Credit sellers were aware of multiple ways of verifying the ecological benefits of credit stacking, with regulatory approval and casual observation being the most prevalent.

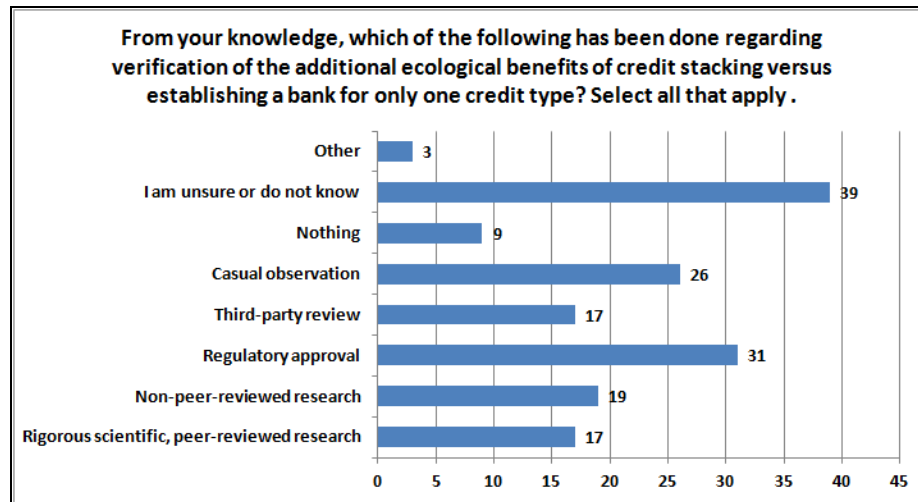


Figure 3-8  
Sellers' Perception of Verification of Ecological Benefits

### Sellers' Future Involvement in Credit Stacking

The next two questions asked respondents whose organizations were not currently involved in credit stacking to indicate their interest or plans in getting involved and if so, what sets of credit types they anticipated becoming involved with. These responses are shown in Figure 3-9 and Figure 3-10.

Over half of sellers are interested in or planning on getting involved in selling stacked credits.

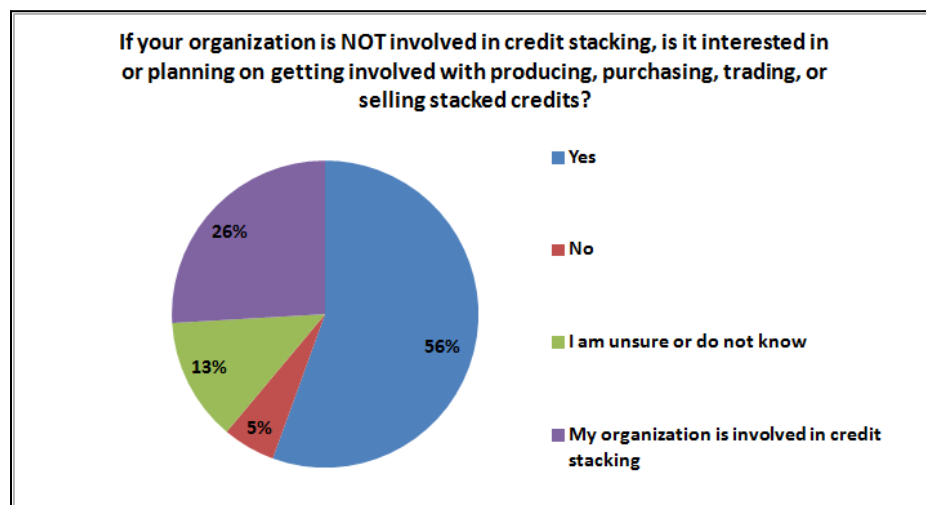


Figure 3-9  
Sellers' Interest/Plans for Credit Stacking Involvement

Credit sellers were interested or planning to be involved with a wide variety of sets of credit types, with species/wetland and water quality/wetland being the most prevalent.

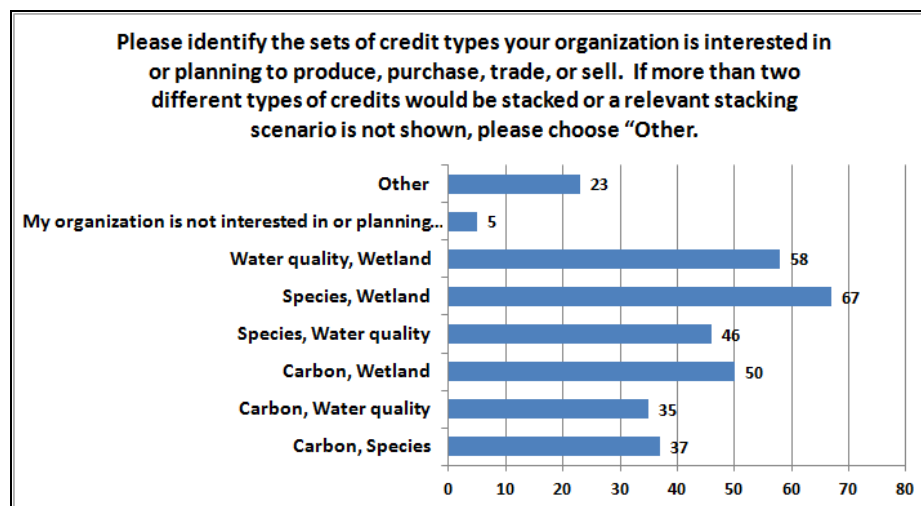


Figure 3-10  
Sellers' Anticipated Sets of Credit Types

## Seller's Comments on Credit Stacking

In addition to answering the specific questions discussed earlier in this section, respondents were given the opportunity to provide any additional comments they had related to credit stacking. A summary of those comments and a few examples follow.

### Positive Comments from Credit Sellers

Several comments were received endorsing the concept of credit stacking and offering suggestions for how it could work. Some representative comments included:

- "A specific credit, like carbon, should be stackable with a compatible credit like water quality or habitat creation for endangered species. A general credit, like wetland mitigation, should not be because all the habitat functions and values are included...Allowing compatible stacking to a carbon credit will provide additional income and additional responsibilities beyond simply sequestering carbon, which ultimately will result in better projects. Wetland mitigation, for instance, when properly regulated, designed and built, pretty much maximizes the habitat and environmental values."
- "Credit stacking...should be allowed if it has an overall benefit for the resource. If you can benefit from impacting natural resources, why can't you benefit from creating them?"
- "I have long argued that, for a great deal of land, conservation and ecological restoration is the highest and best use. Monetizing those values through credit stacking is an important mechanism for making that intrinsic value manifest. If [land] is allowed to become more valuable in an economic sense, more landowners would be willing to put capital at risk to produce eco-credits across the landscape."

Credit sellers provided several suggestions for how to make credit stacking work effectively.

- “In some scenarios, credit stacking recognizes and assigns separate value to the multiple functions provided by a natural resource. If mitigation credit is required for each individual function from the same impacted parcel, then stacking is appropriate.”
- “I would very much like to see stacked credits become available. I think it would enhance mitigation banking as a whole.”

### ***Negative or Cautionary Comments from Credit Sellers***

Several respondents, however, noted that the regulatory uncertainty surrounding credit stacking was a problem or that they had other issues with the viability of credit stacking. Below are some representative comments:

- “A major barrier to credit stacking is regulatory approval, especially where wetland banking is involved.”
- “Regulators vary upon their view/approval of credit stacking. In Florida, for example, the USFWS does not allow it, but in California, they do.”
- “I believe credit stacking would lead to even more criticism of an industry that is already highly scrutinized. Banking continues to have challenges with its public image—the potential complications and/or failures with credit stacking could further damage the industry.”
- “Credit stacking is a tricky business...it could have a clearly positive or clearly negative ecological impacts depending on the types of credits stacked, regulations associated with each credit type (e.g., standards), costs to create and sell credits, etc. This arena must be approached with caution, but if designed/regulated properly, it could result in significant ecological benefits.”

Some sellers are wary of credit stacking due to regulatory uncertainty and other factors.

## Section 4: Researcher Responses

29% of respondents identified themselves as being involved in research.

Eighty-nine (29%) survey respondents identified themselves as being involved in research. In addition to the general question on defining mitigation credit stacking, this group was asked nine specific questions. These questions and their answers are discussed below.

### Researcher's Definition of Credit Stacking

This group's definition of mitigation credit stacking was almost identical to the overall response to this question, as shown in Figure 4-1.

82% of researchers also agreed with the consensus definition of mitigation credit stacking.

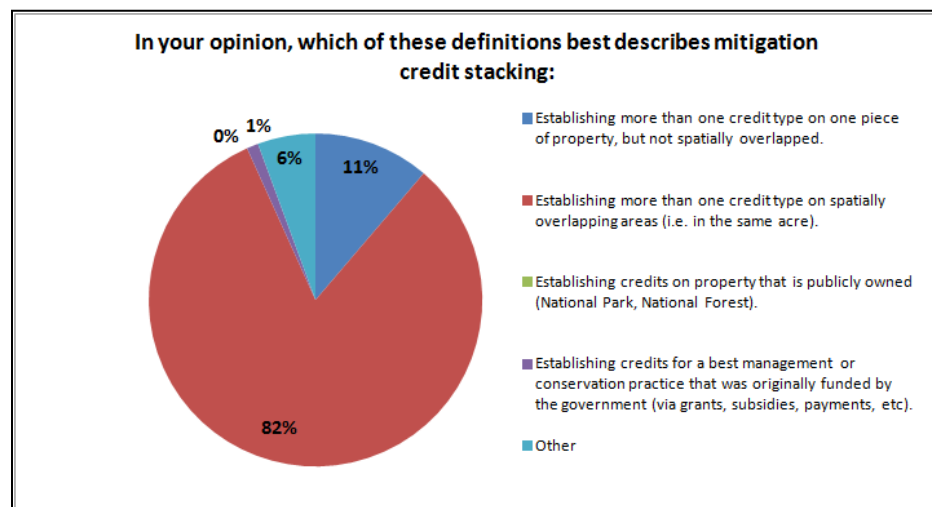


Figure 4-1  
*Researcher Definitions of Mitigation Credit Stacking*

### Researchers' Involvement in Ecosystem Credit Banking and Credit Stacking

The next question asked respondents to identify the types of ecosystem credit banking that they primarily research or track: wetland, water quality, species, carbon or other. These responses are shown in Figure 4-2.

Researchers are focusing most heavily on water quality credits and carbon dioxide and greenhouse gas offsets.

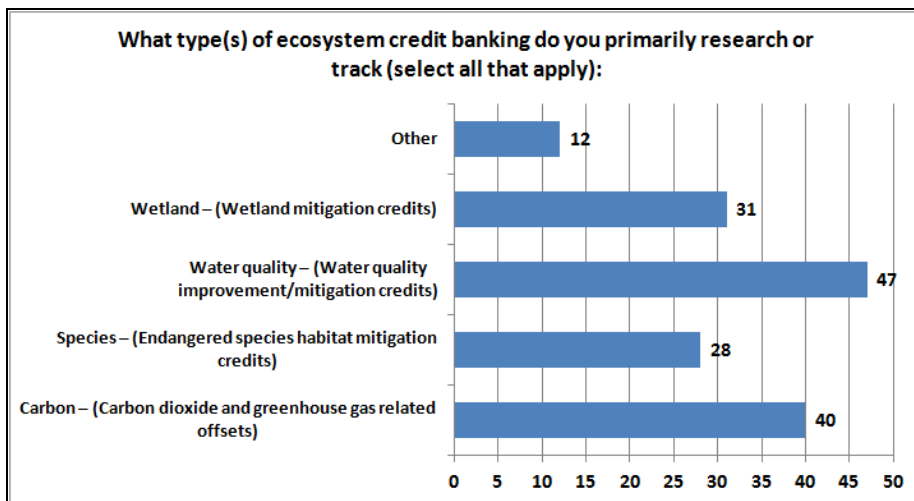


Figure 4-2  
Types of Ecosystem Credit Banking Being Researched or Tracked

The third question asked whether the respondent’s organization was currently involved in researching or tracking stacked credits. As shown in Figure 4-3, 65% of these organizations are researching or tracking stacked credits, demonstrating a strong interest in credit stacking from these types of organizations.

Nearly two-thirds of research respondents are researching or tracking stacked credits.



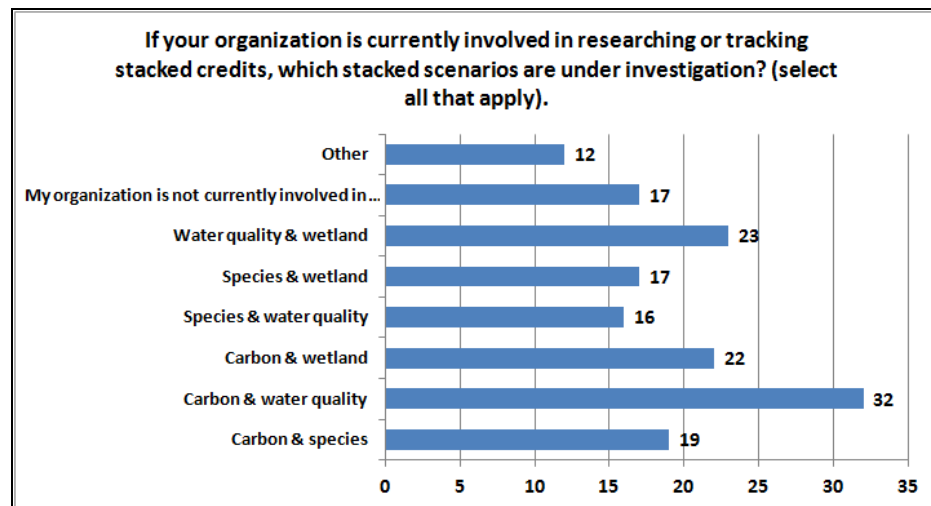
Figure 4-3  
Percentage of Researchers That Are Researching or Tracking Stacked Credits

### Number and Types of Credit Stacking Scenarios Researchers are Investigating or Aware Of

The next two survey questions asked researchers to identify the stacked credit scenarios they are investigating and the number of credit stacking projects they are aware of.

Researchers are investigating a wide variety of credit stacking scenarios, the most prevalent being carbon and water quality.

There were a large number of stacked scenarios being investigated. Although carbon and water quality yielded the most responses, all of the other stacking scenario choices were well represented, as shown in Figure 4-4.



*Figure 4-4*  
*Credit Stacking Scenarios Being Investigated by Researchers*

While slightly more than a quarter of these respondents were not aware of any credit stacking projects, 40% were aware of 1-2 projects and another 32% were aware of three or more. These responses are shown in Figure 4-5.

Over 70% of researchers were aware of one or more credit stacking projects.

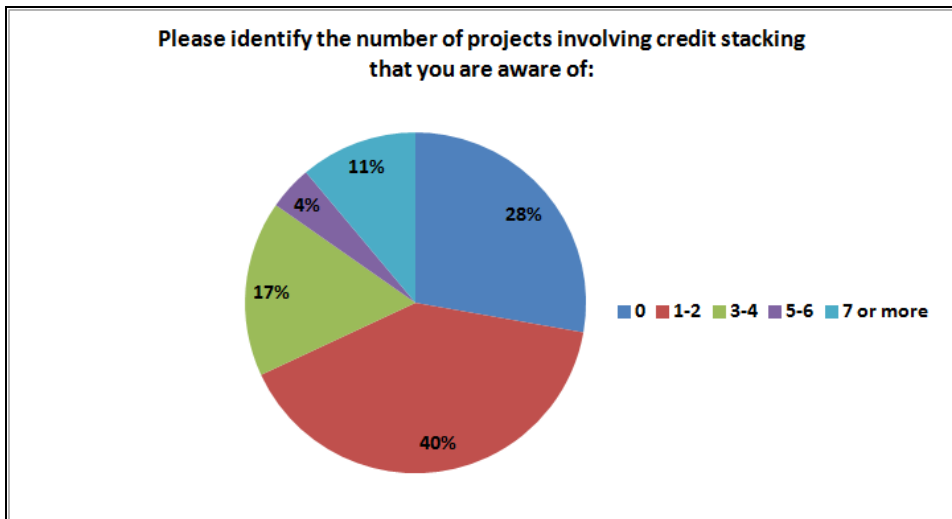


Figure 4-5  
Number of Credit Stacking Projects that Researchers Are Aware of

### Researchers' Awareness of Pending Regulations or Policy Guidance

The next question asked researchers to identify the scenarios that have regulations or policy guidance pending. The most frequently chosen response to this question was that respondents were not aware of any pending regulations or policy guidance, although there was a small but wide distribution across all of the other responses, as shown in Figure 4-6.

Many research respondents were not aware of any pending regulations or policy guidance regarding credit stacking.

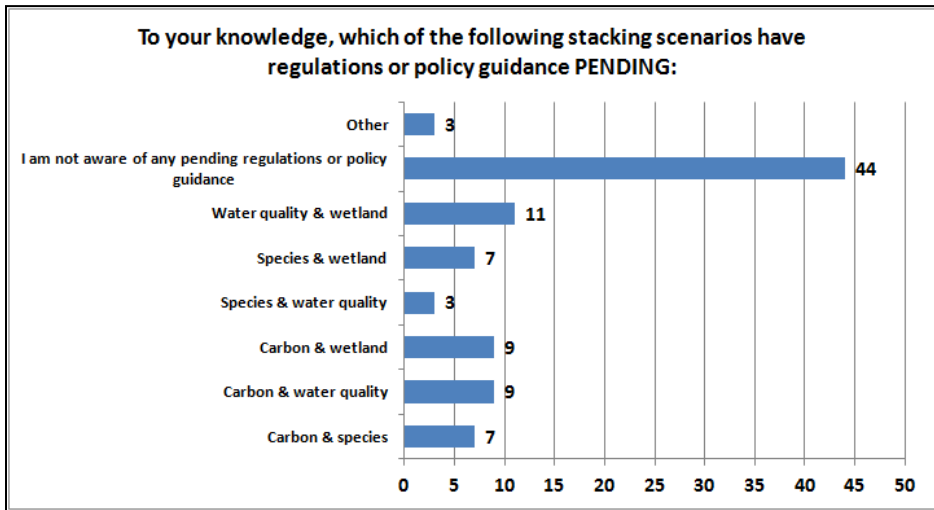


Figure 4-6  
Researchers' Knowledge of Pending Regulations or Policy Guidance



## Researchers' Perceptions of the Ecological Value of Credit Stacking

Researchers were then asked to rate and comment on the ecological value that credit stacking provides over establishing a bank for only one credit type. Nearly half of the respondents believed that credit stacking provides a positive ecological value, with 4% disagreeing and another 37% believing that it depends on the credit stacking scenario. These results are shown in Figure 4-7.

49% of researchers believe that credit stacking has a positive ecological value, although, although 37% believe it depends on the credit stacking scenario.

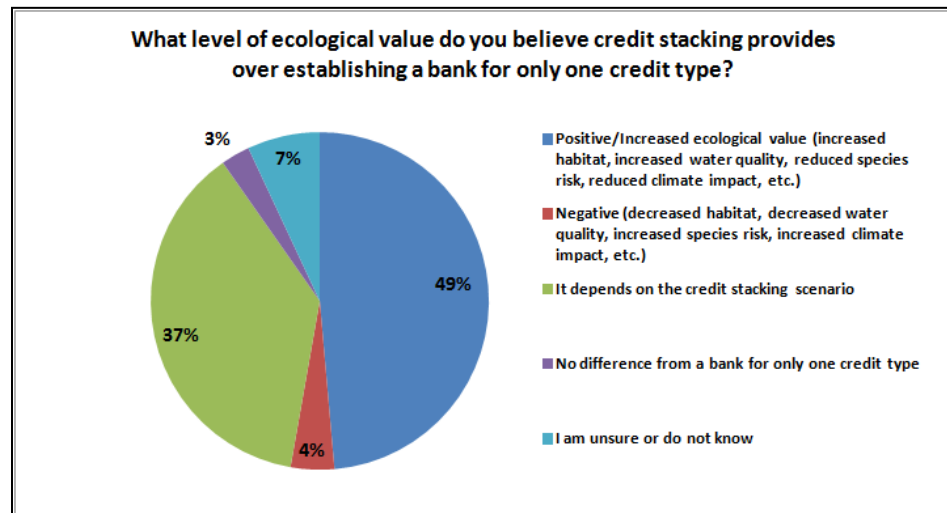


Figure 4-7  
Researchers' Perception of Credit Stacking Ecological Value

## Researchers' Positive Comments on the Ecological Value of Credit Stacking

Many researchers also took the opportunity to provide comments on the ecological value of credit stacking. A few representative comments are shown below:

Some researchers believe that since ecosystems are, in effect, "bundled," that credit stacking makes sense.

- "Stacking can have multiplicative positive effects."
- "Private landowners will be more likely to participate."
- "There is not enough funding for coastal restoration in Louisiana. The current value of carbon credits is too low to pay for a restoration project, but stacking would potentially pay for the cost of the restoration."
- "There is no reason NOT to recognize/renumerate multiple services, since ecosystems provide "bundles" of services."
- In the ecosystem these credits are jointly produced in a bundle. The negative impacts on the ecosystem (reduction of water quality, biodiversity, etc.) come from different sources. Credit stacking allows a transaction where on the seller side a bundle is sold jointly while on the buyer side individuals with interested in a single impact can purchase one or the other of the credits only.

Credit stacking also allows for consideration of inter-linkages between the different credits and eliminated "double accounting."

- "I believe it will be positive to count stacked credits. My impression is also that credit stacking is driven by some sort of fear of double counting or equity or preventing producers from getting paid twice for the same good. This motivation is potentially misguided. The economic system already allows a forest products producer to get paid for the boards produced by cutting a tree and the sawdust or wood chips created on the side and used as mulch or some other product. Why would we think a well functioning economic approach to ecosystem assets should carry some sort of constraints?"

### ***Researchers' Negative Comments on the Ecological Value of Credit Stacking***

Negative comments from researchers on the ecological value of credit stacking focused on redundancy, as well as the belief that credit stacking is a business or policy issue rather than an ecological one.

A few researchers had negative comments about the ecological value or about the wisdom of credit stacking, however. A few of these comments are shown below:

- "It is one site with multiple uses; therefore there should only be one value!"
- "Credit stacking is done for business purposes, not ecological ones."
- "Stacking is a policy issue, not an ecological issue."
- "Unless the project would not proceed without funding from both credits, stacking is redundant; that is, the second credit is not offsetting by funding a new activity that would not have occurred otherwise."

### ***Researcher's Understanding of How Ecological Benefits are Verified***

The next question asked researchers to choose one or more ways in which they believe the additional ecological benefits of credit stacking are verified. This group chose casual observation as the most prevalent response, followed by non-peer-reviewed research, as shown in Figure 4-8.

Researchers believe that casual observation and non-peer-reviewed research are the most common ways of verifying the additional ecological benefits of credit stacking.

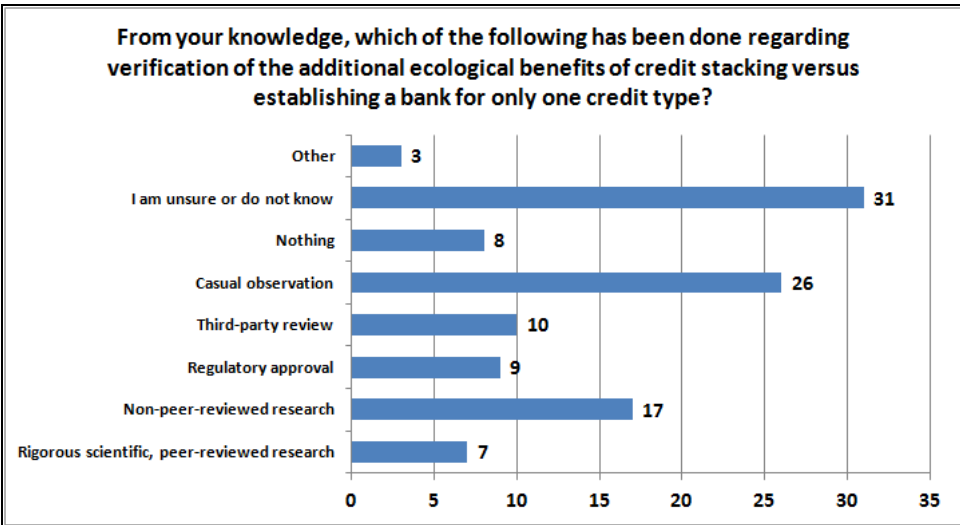


Figure 4-8  
*Researchers’ Perception of Verification of Ecological Benefits*

### Researchers’ Future Involvement in Credit Stacking

The next two questions in the survey asked respondents whether their organizations expected to continue to or to become involved in researching, tracking or verifying stacked credits in the future and if so, the sets of credit types they expected their organization to research and track. These responses are shown in Figure 4-9 and Figure 4-10.

Nearly 80% of researchers’ expect their organizations to continue to be or to become involved in researching, tracking or verifying stacked credits.

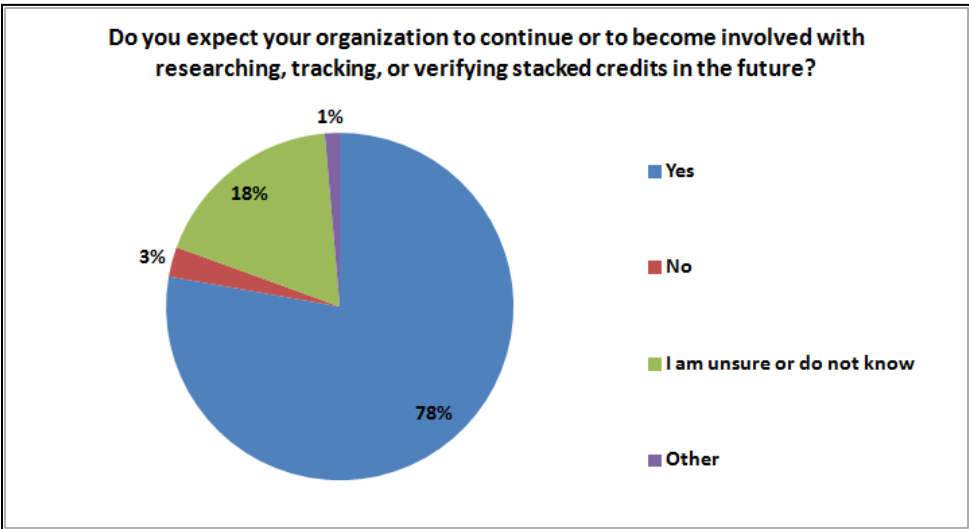


Figure 4-9  
*Researchers’ Interest in Continuing or Becoming Involved with Credit Stacking*

Researchers expect their organizations to research or track all types of stacked credit types, with carbon/water quality being the most prevalent.

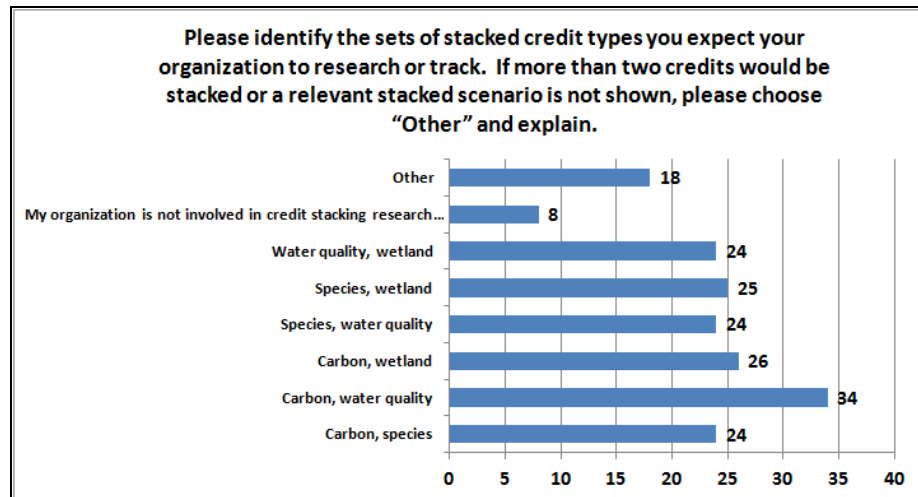


Figure 4-10  
Researchers' Anticipated Sets of Credit Types

## Researchers' Comments on Credit Stacking

Researchers had far fewer general comments to offer on credit stacking than did sellers. A few of the researchers' comments are shown below.

- "The major issue for me is that environmental services would not all be measured in the same areal units. One acre of new trees is meaningful for its carbon sequestration value, but not necessarily meaningful as additional habitat for an endangered species."
- "As you move forward in this field you need a good foundation. That is - one credit value for a site. Anything else will be problematic and likely to be avoided by resource agencies."
- "There is also a critical need to include development impacts and perhaps even credits in carbon/biodiversity projects and the need to develop meaningful metrics and monitoring protocols for these impacts remains a key challenge."
- "This practice may create easier grading of project prioritization."
- "Environmental/ecosystem markets with credit stacking pose lots of challenges to policy-makers. Good ecological models are required to get the ecological inter-linkages right but good market design is also required to facilitate transactions in these markets."

Some researchers expressed concerns about the regulatory and measurement aspects of credit stacking.

## Section 5: Policy-maker Responses

26% of respondents identified themselves as being involved in policy-making.

Eighty-two (26%) survey respondents identified themselves as being involved in policy-making, and are referred to as policy-makers in this report. In addition to the general question on defining mitigation credit stacking, this group was asked 10 specific questions. These questions and their answers are discussed below.

### Policy-makers' Definition of Credit Stacking

As shown in Figure 5-1, policy-makers defined mitigation credit stacking almost identically to the group as a whole, with a slightly larger number of people choosing "other" and a slightly smaller number choosing the consensus definition.

Like credit sellers and researchers, policy-makers showed agreement on the definition of mitigation credit stacking. .

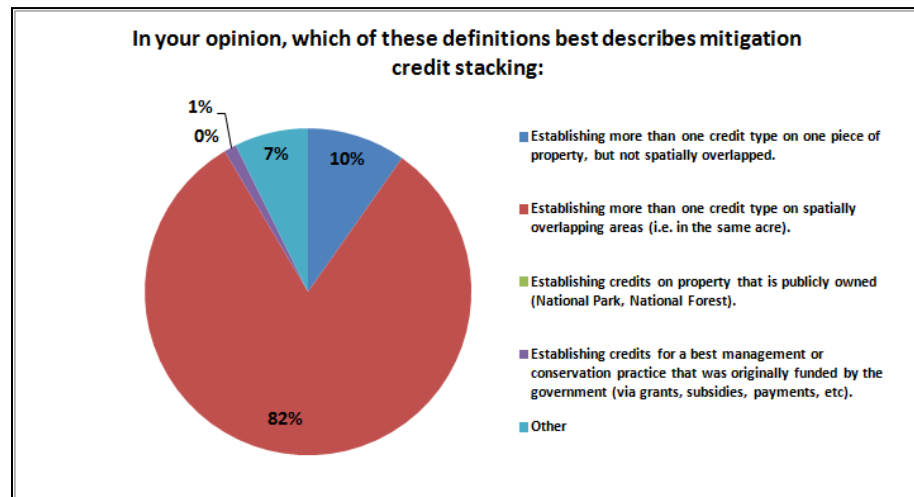


Figure 5-1  
Policy-makers' Definitions of Credit Stacking

### Policy-makers' Involvement in Ecosystem Credit Banking

In the next question, respondents were asked to identify the types of ecosystem credit banking that they are primarily associated with: wetland, water quality, species, carbon or other. These responses are shown in Figure 5-2.

Policy-makers are focusing most heavily on wetland mitigation credits and water quality improvement/mitigation credits.

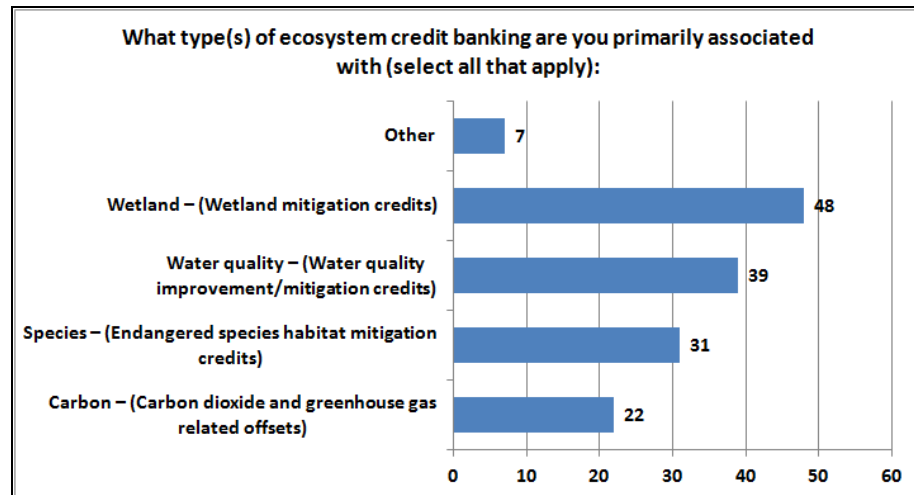


Figure 5-2  
Types of Ecosystem Credit Banking Policy-Makers Are Associated With

### Policy-makers' Involvement in Credit Stacking

The next question asked policy-makers whether their organizations were currently involved in regulating, monitoring or tracking stacked credits. Over half of the respondents said that their organizations were not involved with stacked credits, while 28% were involved. Their responses are shown in Figure 5-3.

Less than one-third of policy-maker respondents' organizations are involved in regulating, monitoring or tracking stacked credits.

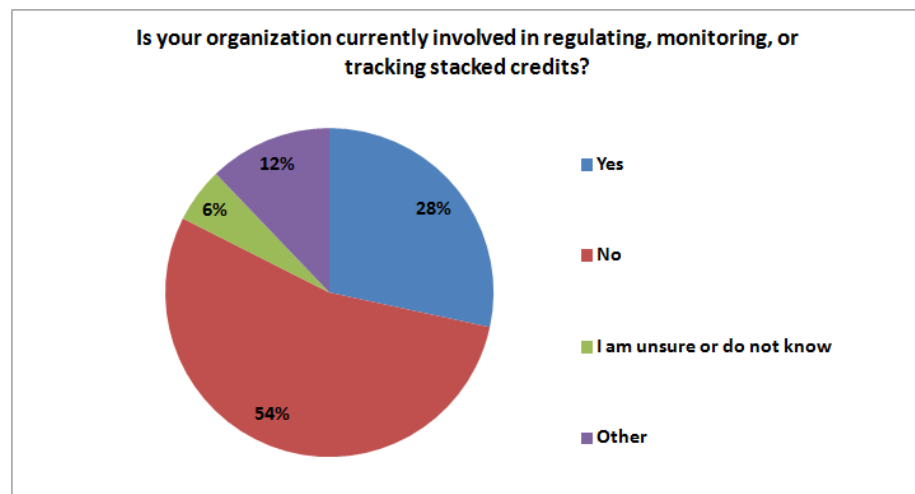


Figure 5-3  
Policy-makers' Involvement with Stacked Credits

12% of policy-makers are involved in “other” types of ecological credit banking activities, and these activities are quite diverse.

### Respondents Who Chose “Other”

Unlike the credit sellers and researchers, however, 12% of the policy-maker respondents chose “other,” and many provided explanations of the type of involvement. These explanations included:

- Ecosystem services credit banking.
- Natural resource damage restoration credits.
- Biodiversity (2 respondents).
- Sulfur dioxide (SO<sub>2</sub>) and nitrous oxide (NO<sub>x</sub>).
- Nitrogen and phosphorous in terms of applications versus runoff.
- Water rights leasing.
- Fire risk management.

### Types of Credit Stacking Scenarios Policy-makers Are Regulating, Monitoring or Tracking

The next question asked policy-makers to identify the types of stacked credits their organization is regulating, monitoring or tracking. These responses are shown in Figure 5-4.

Policy-makers are most involved in regulating, monitoring or tracking wetland mitigation credits and endangered species habitat mitigation credits.

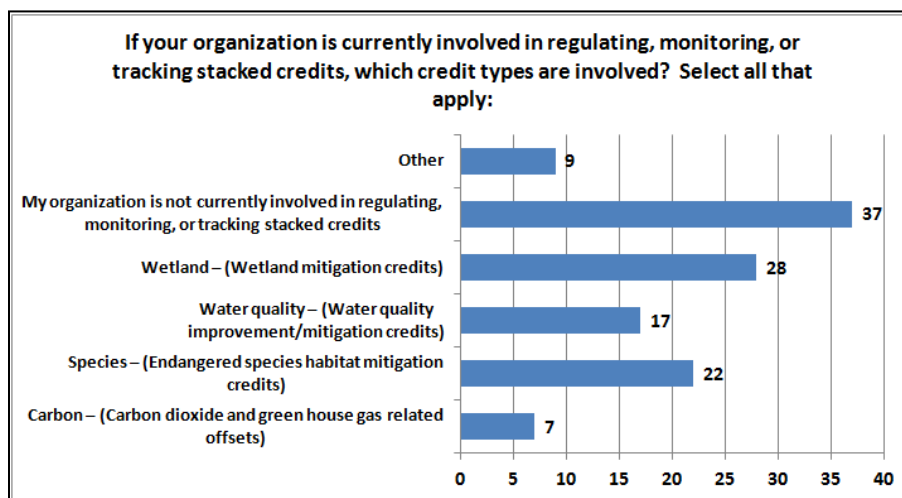


Figure 5-4  
Types of Credit Stacking Policy-makers are Involved In

### Policy-makers’ Awareness of Credit Stacking Scenarios Being Regulated or for which Regulations are Pending

The next two questions asked about their awareness of credit stacking scenarios currently being regulated, monitored and/or tracked and their knowledge of pending regulations or policy guidance.

Policy-makers' answers to the question about those credit stacking scenarios currently being regulated, monitored and/or tracked indicate that they are most familiar with species and wetland and water quality and wetland credit stacking scenarios. Their responses are shown in Figure 5-5.

Policy-makers believe that species and wetland and water quality and wetland credit stacking scenarios are the ones being most actively regulated, monitored and/or tracked.

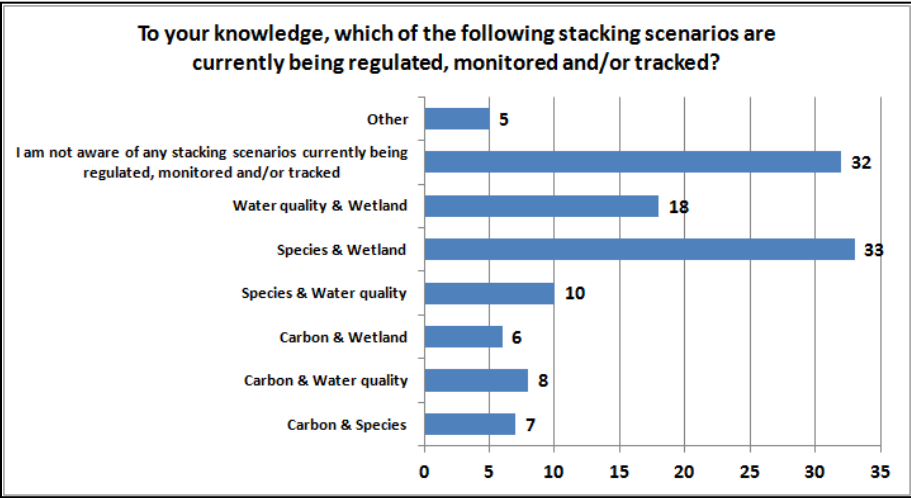


Figure 5-5  
*Policy-makers' Awareness of Credit Stacking Scenarios Being Regulated, Monitored and/or Tracked*

The most prevalent response to the question about credit stacking scenarios for which there are regulations or policy guidance pending was that respondents were not aware of any. There were, however, several responses distributed throughout the different credit stacking scenarios, as shown in Figure 5-6.



Policy-makers were aware of several stacking scenarios for which regulations or policy guidance is pending, with the most prevalent being species and wetland.

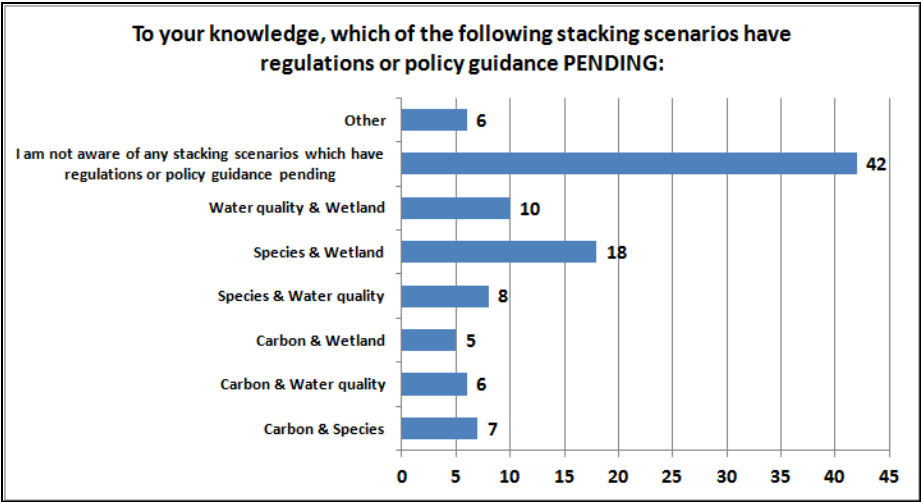


Figure 5-6  
 Policy-makers' Awareness of Pending Regulations or Policy Guidance

### Policy-makers' Awareness of Projects Involving Credit Stacking

The next question asked policy-makers to identify the number of projects they were aware of that involved credit stacking. As shown in Figure 5-7, over half of the respondents were not aware of any credit stacking projects and slightly less than one quarter were aware of 1-2 projects, with the remainder of the responses indicating an awareness of three or more projects.

Roughly half of policy-makers were not aware of any credit stacking projects, while almost one-quarter were aware of 1-2 projects.

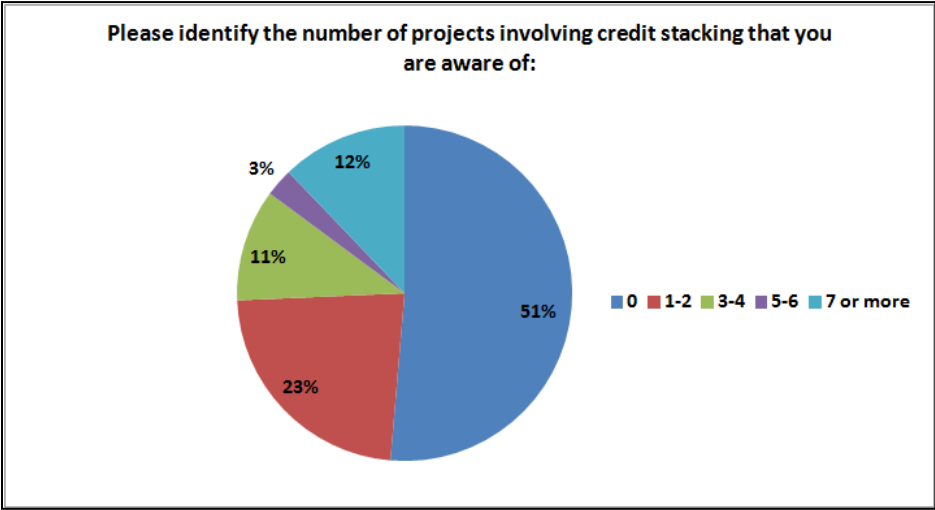


Figure 5-7  
 Policy-makers Awareness of Credit Stacking Projects

## Policy-makers' Perceptions of Ecological Value from Credit Stacking

The next question asked policy-makers about the ecological value they believe results from credit stacking. This group had markedly different responses than sellers and researchers. Whereas most sellers and researchers believed that credit stacking resulted in positive ecological value (51% and 49%, respectively), only 27% of policy-makers shared that belief. The majority of policy-makers believed that ecological value depended on the credit stacking scenario, and 12% believed that credit stacking resulted in a negative ecological value. These responses are shown in Figure 5-8.

Only 27% of policy-makers believed that credit stacking results in a positive ecological value, while most believe it depends on the credit stacking scenario.

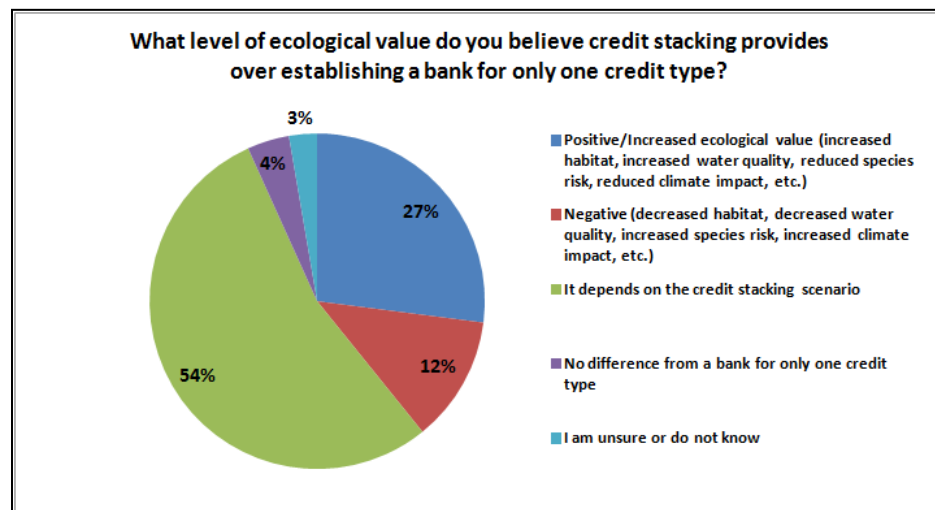


Figure 5-8  
Policy-makers' Perception of Ecological Value of Credit Stacking

## Policy-makers' Comments on the Ecological Value of Credit Stacking

Respondents were also given the opportunity to comment on the ecological value of credit stacking. A few of these responses are shown below:

### Policy-makers Positive Comments on Ecological Value

- "The ability to stack credits will increase voluntary incentives for landowners to participate and more beneficial practices will be voluntarily provided."
- "I believe stacking credits can lead to a more holistic ecosystem-based mitigation scenario. For example, if stacking is not allowed and we manage for only carbon, then we may choose a monoculture geared toward maximizing carbon. However, if we are able to stack credits, then we may engineer a project that blends carbon, species and water quality. The sum total of these stacked credits may generate higher economic value and a great value to the ecosystem services provided."

Some policy-makers offered positive comments on the ecological value of credit stacking, although many noted the importance of accurate metrics and measurement systems.

Some policy-makers believed there could be a negative ecological value from credit stacking.

- “From a landowner perspective, the more ecosystem services that can be stacked, the more likely you have participation, which increases the likelihood of those lands continuing to provide the services.”
- “May yield positive results, depending on incentives.”
- “I think if done correctly credit stacking can be done without ‘double dipping,’ but the devil is in the details.
- “The net benefit depends on how each credit is defined and whether or not the value of each is being maximized, but need data/modeling and performance management systems in place to make sure positive effects actually occur.”

#### Policy-makers Negative Comments on Ecological Value

- “None. Wetlands function to provide most credit types. Therefore, when mitigating for an acre of wetland lost, all these functions must be compensated.”
- “Credit stacking could result in a net resource loss, inflated land values and is ripe for abuse. A lot has to do with the accounting. For example, because of the way many wetland mitigation bank credits are assessed, it is hard to point to one acre as having X value for functions and values under CWA [Clean Water Act] versus species habitat values under ESA [Endangered Species Act].”
- “Some sites lend themselves to credit stacking, but at other sites, trying to stack different types of credits can be mutually exclusive. For example, trying to maximize carbon credits on a site suited for wet prairie restoration.”

#### ***Policy-makers Understanding of How Ecological Benefits are Verified***

The next question asked policy-makers to choose one or more ways in which they believe the additional ecological benefits of credit stacking are verified. The respondents believed that the most prevalent ways were regulatory approval and casual observation, as shown in Figure 5-9.

Policy-makers believed that regulatory approval and casual observation were the most common ways of verifying the additional ecological benefits of credit stacking.

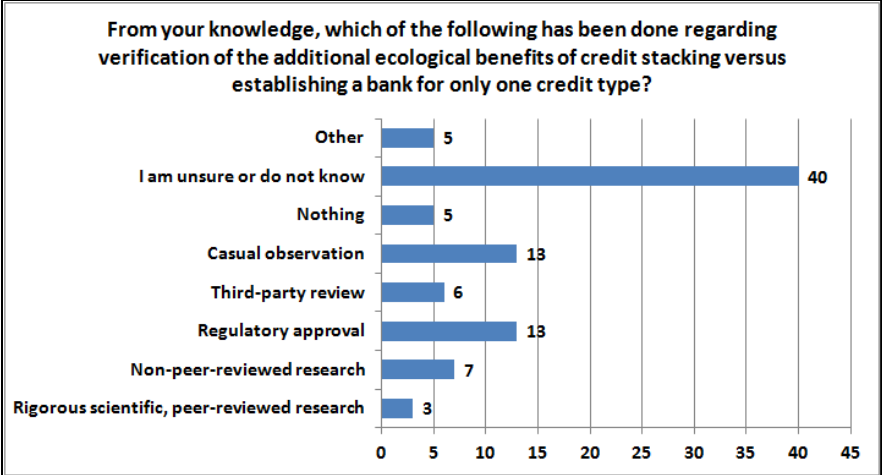


Figure 5-9  
*Policy-makers Perception of Verification of Ecological Benefits*

### Policy-makers Future Involvement in Credit Stacking

The next two questions asked policy-makers to indicate whether they expected their organizations to get involved in regulating, monitoring or tracking stacked credits in the future and if so, the sets of stacked credit types they anticipated become involved with.

65% of policy-maker respondents expect their organizations to become involved in credit stacking.

Nearly two-thirds of respondents indicated that they believed their organizations would become involved in credit stacking in the future. Seventeen percent of respondents did not expect their organizations to become involved, and the 18% who selected “Other” were unsure, with most of that uncertainty based on developing regulatory situation. These responses are shown in Figure 5-10.

While 17% of respondents don't expect their organizations to become involved with regulating, monitoring, or tracking credit stacking, another 18% were unsure and 65% expect to become involved.

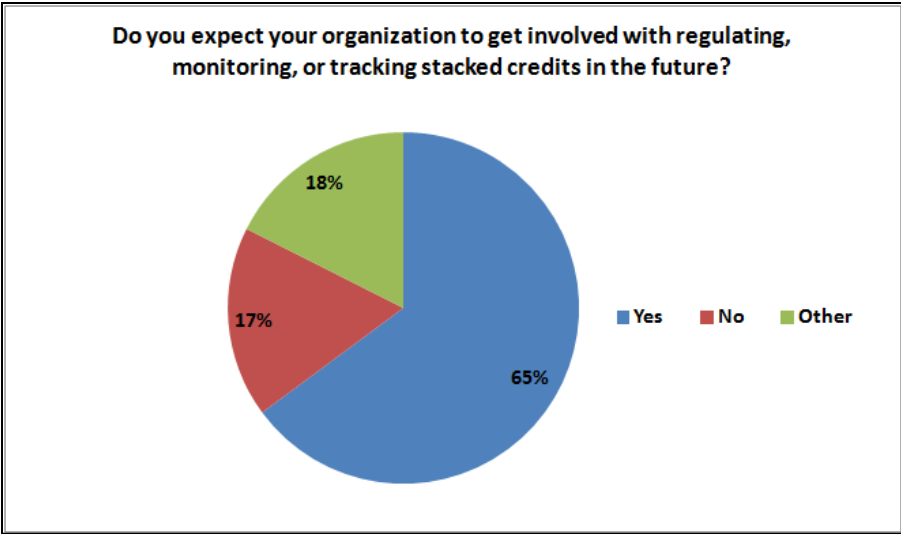


Figure 5-10  
*Policy-makers Perception of Future Involvement in Credit Stacking*

The question about the types of stacked credits that policy-makers expect their organizations to become involved with demonstrated that this group expects their organizations to become involved in a wide variety of stacked credit types, with the most predominant being species, wetland. These responses are shown in Figure 5-11.

Policy-makers expect their organizations to become involved in a wide variety of stacked credit types, with the most prevalent being species, wetland.

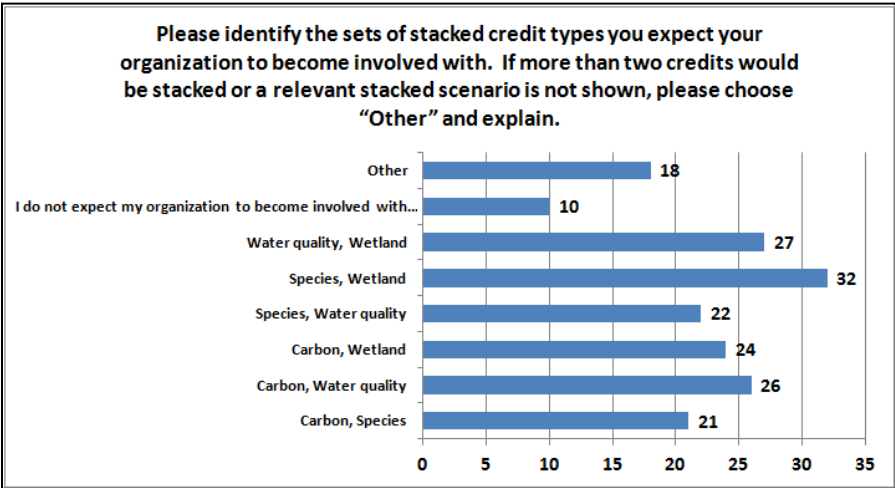


Figure 5-11  
*Sets of Stacked Credit Types Policy-makers Expect Their Organization to Become Involved With*

Policy-makers' general comments on credit stacking provided insight into the complexities involved in making credit stacking viable.

## Policy-makers Comments on Credit Stacking

In addition to answering the specific questions discussed earlier in this section, respondents were given the opportunity to provide any additional comments they had related to credit stacking. A few of these comments are shown below:

- “We are very concerned that single purpose ecosystem service markets will not contribute much to integrated, cross-boundary, landscape scale conservation, and if improperly implemented, may exacerbate the problem. We are also concerned about the single-minded focus on a single resource, like carbon, adversely affecting other values, like biodiversity. Also, we are convinced that it is necessary for landowners to be able to sell multiple services to effectively compete with commodity production and sustain the land and biodiversity over time. Public policies on stacking should support and reward integrated cross-boundary conservation projects in priority locations.”
- “Few stacking proposals are viable because most proposals are requests for credit for an environmental service/function that has already been accounted for in assigning the 'first credit,' e.g. carbon sequestration is one of the ecological services or functions that is accounted for in assigning a wetland credit - there would be no remaining carbon function left on the same acre to allow for carbon credit stacking. Few functions can be stacked where wetland mitigation credits are assigned because wetland credit typically assumes the 'use' of several environmental services provided on a given acre. The same acre could generate a credit that could theoretically be used for multiple kinds of compensation, e.g., acre X could be used to mitigate for either endangered species impacts OR wetland impacts.”
- “You also need to address ‘stacking’ in terms of ‘within-type’ regulatory jurisdiction as well as ‘cross-type’ stacking. Although it is more likely to ‘come out in the wash,’ tracking wetland credits varies between agencies that regulate wetlands, e.g., federal and state agencies awarding different numbers and/or types of credits to a particular bank and keeping separate ledgers for those banks provides the opportunity of running out of some type of credit (i.e., state flatwoods credits) while the feds may still have credits on the ledger and use them for additional projects.”
- “Stacking is complex, it has as much to do with added environmental value (using different vegetation on a buffer established for water quality to attract wildlife) as it does on adoption economics. If we limit the amount of money made on a parcel of land too much, then conservation adoption declines, if we give away too many payments for the same action then that excess money is wasted in a paper trail and not in actual advances in conservation. No real study that I am aware of brings into account the landowner’s economic and quality of life goals specifically; that is a on a detailed evaluation. Stacking should be allowed when it promotes adoption based on the land manager’s personal tipping point for saying yes. That is a hard thing to regulate because it is a "market" value and changes all the time.

- “It is important to bring into the discussion agricultural groups working on policy for climate change, water quality, etc. They are not as engaged with the stackable credit discussion but they need to be. Also, they are beginning to advocate for policies that will allow stacking such as including legislative language in the Farm Bill and in the climate bills.”
- “The definition of stacking used here is imprecise. It does not consider the practice in use for banks that provide compensation under Section 404 of the CWA and federal and state-listed species. It is not unusual to see a bank in CA providing compensation under ESA and 404. However, the bank may have a pool of credits and those credits may be used for ESA or 404 but the same credit cannot be used for two different projects.”
- “Makes a simple problem much more complicated and probably to the detriment of the overall purpose of mitigation, replacing functional loss through ecological restoration of degraded systems.”





## Section 6: Summary and Conclusions

A survey entitled “Evaluation of Credit Stacking” was developed jointly by EPRI, the World Resources Institute, Stetson University College of Law and the University of Kentucky. The survey was sent via e-mail to approximately 1,500 practitioners involved in markets for environmental credits. Note that an analysis paper titled, “Stacking Opportunities and Risks in Environmental Credit Markets” was published in February 2011 based on these survey results. (Fox et al. Environmental Law Reporter. Feb 2011. 41 ELR 10121- 10125).

38% of respondents identified themselves as credit sellers, 29% as researchers, 26% as policy-makers, 6% as credit buyers and 1% as credit exchangers.

Responses were received from 309 individuals, or approximately 20% of those to whom the survey was sent. Respondents were asked to identify themselves as being primarily associated with for-profit, non-profit, government agency, academic or other types of organizations. They were also asked to specify their primary involvement in ecosystem markets as being credit banking/producing/selling, credit buying, policy-making, researching or exchanging/brokering. Ninety-four percent of respondents identified themselves as either credit sellers, researchers or policy-makers, with only a few respondents identifying themselves as credit buyers or credit exchangers. Based on the response rate from the particular groups, credit sellers, researchers and policy-makers were determined to represent statistically significant categories and further analysis was conducted on these responses.

### **Consensus Opinions from All Respondents**

Two questions elicited consensus opinions from the majority of survey respondents: the definition of credit stacking and whether respondents were involved in or interested in becoming involved in credit stacking.

### ***Definition of Mitigation Credit Stacking***

All respondents were asked to choose one of five definitions of “mitigation credit stacking” that they felt was most accurate:

1. Establishing more than one credit type on one piece of property, but not spatially overlapped.
2. Establishing more than one credit type on spatially overlapping areas (i.e., in the same acre).
3. Establishing credits on property that is publicly owned (National Park, National Forest).

83.5% of respondents believed that the best definition for mitigation credit stacking was “establishing more than one credit type on spatially overlapping areas.”

4. Establishing credits for a best management or conservation practice that was originally funded by the government (via grants, subsidies, payments, etc.).
5. Other

Strong consensus was found for definition 2, with 83.5% agreeing with this definition, while definition 1 was chosen by 10% of respondents.

### ***Interest in Credit Stacking***

There was also consensus from all recipients about their interest in credit stacking, with 73.6% stating that they are either already involved in credit stacking or that they are interested in getting involved in the future.

### **Summary of Responses from Sellers, Researches and Policy-makers**

Based on the responses to specific questions from credit sellers, researchers, and policy-makers, some consensus opinions emerged, while other questions elicited mixed responses. These responses are summarized below.

- The type of ecosystem credit banking that respondents were most associated with was wetland, followed by water quality, species and carbon.
- While two-thirds of researchers are currently involved with stacked credits, only 33% of sellers and 28% of policy-makers are involved.
- Sellers were asked to specify how many credit stacking projects they are involved with, with the most prevalent response being 1-2 projects.
- Sellers and researchers are most involved in carbon and water quality; species and wetland; and water quality and wetland credit stacking types.
- Policy-makers are most involved in regulating, monitoring or tracking wetland and species stacked credit.
- Approximately 70% of sellers who are involved in credit stacking believed that it increased the financial value of their projects. The other groups were not asked this question.
- Researchers and policy-makers were asked to identify the stacking scenarios that have regulations or policy guidance pending. The most common answer was that respondents were not aware of any pending regulations or policy guidance, followed by species/wetland and water quality/wetland.
- Researchers and policy-makers were asked to identify the number of stacked credit projects they were aware of. In both groups, approximately 70% of respondents were either not aware of any stacked projects or aware of 1-2 such projects.
- All three groups were asked about the ecological value of credit stacking, with the choices being positive, negative, dependent on the stacking scenario, no difference and unsure. An average of the responses shows that 42% believe credit stacking has a positive ecological value, 42% believe it depends

73.6% of respondents are either involved in credit stacking or are interested in getting involved in the future.

Researchers are the only group that is strongly involved with stacked credits.

70% of sellers involved with credit stacking believed it increased the financial value of their projects.

The vast majority believed that credit stacking either had a positive ecological impact or that the impact depended on the credit stacking scenario.



The majority of respondents expect their organizations to become involved in credit stacking, and most respondents anticipate becoming involved in some sort of scenario involving wetlands

on the credit stacking scenario, 8% believe it has a negative value, 3% believe it makes no difference and 4% were unsure.

- All three groups were also asked to identify what has been done regarding verification of the additional benefits of credit stacking versus establishing a bank for only one credit type. The most common response was “I am unsure or do not know,” followed by casual observation, regulatory approval and non-peer-reviewed research.
- When asked whether they expected their organizations to get involved with stacked credits, approximately two-thirds of respondents indicated they did expect their organizations to become involved.
- When asked which types of stacked credit sets they anticipate becoming involved in, the most prevalent response was species/wetland, followed by water quality/wetland and carbon/wetland.

## Conclusions

The answers provided by the survey respondents as well as the comments they provided yielded a few definite themes:

- There is a strong consensus on the definition of credit stacking as “establishing more than one credit type on spatially overlapping areas, i.e., in the same acre.”
- Nearly three-quarters of the survey respondents are involved in or interested in credit stacking.
- Credit stacking may result in positive ecological value, but the credit stacking scenario plays a large part in whether this value can be obtained, and there is little consensus on or awareness of how these ecological benefits are being verified.
- There is also little consensus on existing or pending regulations or regulatory guidance. This is a reflection of the fact that there are many different federal, state, and local agencies that may be involved in making and enforcing regulatory decisions.
- There is a need for regulatory guidance, clarity and consistency.

Please refer to the paper, “Stacking Opportunities and Risks in Environmental Credit Markets” for more additional discussion and analysis. (Fox et al. Environmental Law Reporter. Feb 2011. 41 ELR 10121- 10125).





## Appendix A: Complete “Evaluation of Credit Stacking” Survey

*The Electric Power Research Institute (EPRI), in collaboration with the World Resources Institute, Stetson University College of Law, and the University of Kentucky are conducting a query to assess the current state of carbon, species, water quality, and wetland credit stacking. The purpose of this query is to collect a comprehensive set of data to evaluate the current state of mitigation credit stacking practices in the United States. You have been chosen to participate due to your direct affiliation with the credit banking market.*

*Please take 5 minutes to answer the few short questions that follow. We will follow up with telephone interviews as necessary to collect additional information.*

*Your responses in part or in their entirety to this survey (excluding your identification) may be used to generate compiled response statistics, which may be published, posted on the EPRI website, and viewable by the general public. Your name and organization will not be reported or associated with specific responses without your written permission.*

*By clicking “Next” below, you are certifying that your survey responses will not include proprietary information owned by your organization or any third party organization, and you are hereby granting permission to EPRI or its designees, without compensation, to post your survey responses on the EPRI website and publish, republish, transmit and distribute your survey responses in an electronic and print form in any language.*

Please enter the following contact information so that we may validate survey inputs, contact you with a follow-up interview, as necessary, and send you the results of our research. This information will be used only for the purposes of this research effort.

Name:


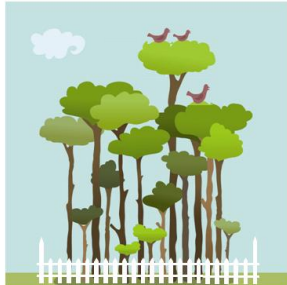
Organization:

Email Address:

1. What type of organization are you primarily associated with:
  - a) For-profit
  - b) Nonprofit
  - c) Government agency
  - d) Academic
  - e) Other
2. How are you primarily involved in ecosystem markets:
  - a) Credit bank/producer/seller
  - b) Credit buyer
  - c) Policy making
  - d) Research
  - e) Credit exchange/broker: i.e. Chicago Climate Exchange or the like.
3. In your opinion, which of these definitions best describes mitigation credit stacking:
  - a) Establishing more than one credit type on one piece of property, but not spatially overlapped.
  - b) Establishing more than one credit type on spatially overlapping areas (i.e. in the same acre).
  - c) Establishing credits on property that is publicly owned (National Park, National Forest).
  - d) Establishing credits for a best management or conservation practice that was originally funded by the government (via grants, subsidies, payments, etc.).
  - e) Other \_\_\_\_\_

*For Credit banks/producers/sellers (if Q2 = “a”):*

For purposes of this survey, **credit stacking** is defined as **establishing more than one credit on spatially overlapping areas**. Credit types include carbon, endangered species, water quality, and wetlands. Please see the image below for an example:

Not Stacked (Spatially Distinct)		Stacked (Spatially Overlapped)
1 acre forest earning carbon credits	1 acre forest earning endangered species habitat credits	1 acre forest earning both carbon credits and endangered species habitat credits
 <p>One property</p>		 <p>One property</p>
Total Credits = 2 Total Acres Mitigated = 2		Total Credits = 2 Total Acres Mitigated = 1

- What type(s) of ecosystem credit banking are you primarily associated with (select all that apply):
  - Carbon – (carbon dioxide and greenhouse gas related offsets)
  - Species – (endangered species habitat mitigation credits)
  - Water quality – (water quality improvement/mitigation credits)
  - Wetland – (wetland habitat mitigation credits)
  - Other \_\_\_\_\_
- Has your organization been involved in the producing, purchasing, trading, or selling of stacked credits? (Credit stacking refers to the production of two or more different types of ecosystem credits (e.g., carbon, species, wetlands, water quality) on spatially overlapping areas)
  - Yes
  - No
  - I am unsure or do not know


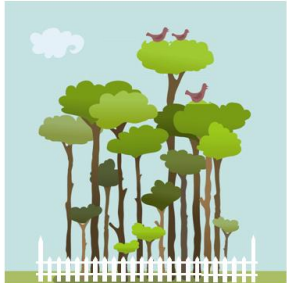
3. If your organization has been involved in credit stacking, please identify the number of projects which involve stacked credits:
- a) 1-2
  - b) 3-4
  - c) 5-6
  - d) 7 or more
  - e) My organization is not involved in credit stacking
4. If your organization is currently involved in credit stacking, please identify the sets of credit types being stacked (select all that apply). If more than two credits are stacked or a stacked scenario is not shown, please choose "Other" and explain.
- a) Carbon & species
  - b) Carbon & water quality
  - c) Carbon & wetland
  - d) Species & water quality
  - e) Species & wetland
  - f) Water quality & wetland
  - g) My organization is not involved in credit stacking
  - h) Other \_\_\_\_\_
5. If your organization is involved in credit stacking, what level of financial value have you found it to have?
- a) Positive/Increased financial value
  - b) Negative/Decreased financial value
  - c) No difference from non-stacked credits
  - d) I am unsure or do not know
  - e) My organization is not involved in credit stacking
6. What level of ecological value do you believe credit stacking provides over establishing a bank for only one credit type?
- a) Positive (increased habitat, increased water quality, reduced species risk, reduced climate impact, etc.)
  - b) Negative (decreased habitat, decreased water quality, increased species risk, increased climate impact, etc.)
  - c) No difference from a bank for only one credit type
  - d) It depends on the credit stacking scenario
  - e) I am unsure or do not know
  - f) Please explain: \_\_\_\_\_



7. From your knowledge, which of the following has been done regarding verification of the additional ecological benefits of credit stacking versus establishing a bank for only one credit type? Select all that apply and please provide references if possible:
- a) Rigorous scientific, peer-reviewed research
  - b) Non-peer-reviewed research
  - c) Regulatory approval
  - d) Third-party review
  - e) Casual observation
  - f) Nothing
  - g) I am unsure or do not know
  - h) Other \_\_\_\_\_
  - i) References \_\_\_\_\_
8. If your organization is NOT involved in credit stacking, is it interested in or planning on getting involved with producing, purchasing, trading, or selling stacked credits?
- a) Yes
  - b) No
  - c) I am unsure or do not know
  - d) My organization is involved in credit stacking
9. Please identify the sets of credit types your organization is interested in or planning to produce, purchase, trade, or sell. If more than two different types of credits would be stacked or a relevant stacking scenario is not shown, please choose "Other" and explain.
- a) Carbon, species
  - b) Carbon, water quality
  - c) Carbon, wetland
  - d) Species, water quality
  - e) Species, wetland
  - f) Water quality, wetland
  - g) My organization is not interested in or planning to produce, trade, or sell any stacked credits
  - h) Other \_\_\_\_\_
10. Please list the names of specific projects, individuals, websites, etc. where we could locate more information on projects which involved the production, purchase, trade, or sale of stacked credits.
11. Please provide any additional comments or questions you have related to credit stacking or this research effort.

*For Credit buyers (if Q2 = "b"):*

For purposes of this survey, **credit stacking** is defined as **establishing more than one credit on spatially overlapping areas**. Credit types include carbon, endangered species, water quality, and wetlands. Please see the image below for an example:

Not Stacked (Spatially Distinct)		Stacked (Spatially Overlapped)
1 acre forest earning carbon credits	1 acre forest earning endangered species habitat credits	1 acre forest earning both carbon credits and endangered species habitat credits
 <p>One property</p> <p>Total Credits = 2 Total Acres Mitigated = 2</p>		 <p>One property</p> <p>Total Credits = 2 Total Acres Mitigated = 1</p>


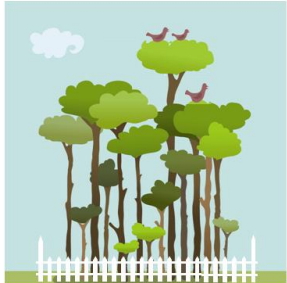
- What type(s) of ecosystem credit banking are you primarily associated with (select all that apply):
  - Carbon – (carbon dioxide and greenhouse gas related offsets)
  - Species – (endangered species habitat mitigation credits)
  - Water quality – (water quality improvement/mitigation credits)
  - Wetland – (wetland mitigation credits)
  - Other \_\_\_\_\_
- Is your organization currently purchasing multiple credit types (carbon, species, water quality, wetland):
  - Yes
  - No
  - I am unsure or do not know
- If your organization is purchasing multiple credit types, are these coming from a seller that stacks credits? (Credit stacking refers to the production of two or more different types of ecosystem credits [e.g., carbon, species, wetlands, water quality] on spatially overlapping areas)
  - Yes
  - No
  - I am unsure or do not know
  - My organization is not involved in credit stacking

4. If your organization is currently purchasing stacked credits, please identify the sets of credit types being purchased (select all that apply). If the purchase involves more than two different types of credits or a relevant stacking scenario is not shown, please choose “Other” and explain.
- a) Carbon & species
  - b) Carbon & water quality
  - c) Carbon & wetland
  - d) Species & water quality
  - e) Species & wetland
  - f) Water quality & wetland
  - g) My organization is not currently purchasing stacked credits
  - h) Other \_\_\_\_\_
5. If your organization is purchasing stacked credits, what level of financial value have you found it to have versus generating those credits internally or purchasing them as separate credit types from multiple credit brokers?
- a) Positive/Increased financial value
  - b) Negative/Decreased financial value
  - c) No difference versus generating credits internally or purchasing as separate credit types from multiple credit brokers
  - d) I am unsure or do not know
  - e) My organization is not currently purchasing stacked credits
6. What level of ecological value do you believe credit stacking provides over establishing a bank for only one credit type?
- a) Positive/Increased ecological value (increased habitat, increased water quality, reduced species risk, reduced climate impact, etc.)
  - b) Negative (decreased habitat, decreased water quality, increased species risk, increased climate impact, etc.)
  - c) No difference from a bank for only one credit type
  - d) It depends on the credit stacking scenario
  - e) I am unsure or do not know
  - f) Please explain: \_\_\_\_\_

7. From your knowledge, which of the following has been done regarding verification of the additional ecological benefits of credit stacking versus establishing a bank for only one credit type? Select all that apply and please provide references if possible:
- a) Rigorous scientific, peer-reviewed research
  - b) Non-peer-reviewed research
  - c) Regulatory approval
  - d) Third-party review
  - e) Casual observation
  - f) Nothing
  - g) I am unsure or do not know
  - h) Other \_\_\_\_\_
  - i) References \_\_\_\_\_
8. Is your organization planning on continuing or getting involved in credit stacking (i.e., purchasing or selling stacked credits)?
- a) Yes, as buyers
  - b) Yes, as sellers
  - c) Yes, as buyers and sellers
  - d) No, not planning on participating
  - e) Yes, but only for research purposes
  - f) Other \_\_\_\_\_
9. Please identify the sets of credit types your organization is planning on continuing or getting involved with. If more than two different types of credits would be stacked or a relevant stacking scenario is not shown, please choose "Other" and explain.
- a) Carbon, species
  - b) Carbon, water quality
  - c) Carbon, wetland
  - d) Species, water quality
  - e) Species, wetland
  - f) Water quality, wetland
  - g) My organization is not planning on getting involved in stacking
  - h) Other \_\_\_\_\_
10. Please list the names of specific projects, individuals, websites, etc. where we could locate more information on projects which involved the production, purchase, trade, or sale of stacked credits.
11. Please provide any additional comments or questions you have related to credit stacking or this research effort.

*For Policy-Maker (if Q2 = “c”):*

For purposes of this survey, **credit stacking** is defined as **establishing more than one credit on spatially overlapping areas**. Credit types include carbon, endangered species, water quality, and wetlands. Please see the image below for an example:

Not Stacked (Spatially Distinct)		Stacked (Spatially Overlapped)
1 acre forest earning carbon credits	1 acre forest earning endangered species habitat credits	1 acre forest earning both carbon credits and endangered species habitat credits
 <p>One property</p>		 <p>One property</p>
Total Credits = 2 Total Acres Mitigated = 2		Total Credits = 2 Total Acres Mitigated = 1

- What type(s) of ecosystem credit banking are you primarily associated with (select all that apply):
  - Carbon – (carbon dioxide and greenhouse gas related offsets)
  - Species – (endangered species habitat mitigation credits)
  - Water quality – (water quality improvement/mitigation credits)
  - Wetland – (wetland mitigation credits)
  - Other \_\_\_\_\_
- Is your organization currently involved in regulating, monitoring, or tracking stacked credits? (Credit stacking refers to the production of two or more different types of ecosystem credits [e.g., carbon, species, wetlands, water quality] on spatially overlapping areas)
  - Yes
  - No
  - I am unsure or do not know
  - Other \_\_\_\_\_

3. If your organization is currently involved in regulating, monitoring, or tracking stacked credits, which credit types are involved? Select all that apply:
- a) Carbon – (carbon dioxide and greenhouse gas related offsets)
  - b) Species – (endangered species habitat mitigation credits)
  - c) Water quality – (water quality improvement/mitigation credits)
  - d) Wetland – (wetland mitigation credits)
  - e) My organization is not currently involved in regulating, monitoring, or tracking stacked credits
  - f) Other \_\_\_\_\_
4. To your knowledge, which of the following stacking scenarios are currently being regulated, monitored and/or tracked:
- a) Carbon & species
  - b) Carbon & water quality
  - c) Carbon & wetland
  - d) Species & water quality
  - e) Species & wetland
  - f) Water quality & wetland
  - g) I am not aware of any stacking scenarios currently being regulated, monitored and/or tracked
  - h) Other \_\_\_\_\_
5. To your knowledge, which of the following stacking scenarios have regulations or policy guidance PENDING:
- a) Carbon & species
  - b) Carbon & water quality
  - c) Carbon & wetland
  - d) Species & water quality
  - e) Species & wetland
  - f) Water quality & wetland
  - g) I am not aware of any stacking scenarios which have regulations or policy guidance pending
  - h) Other \_\_\_\_\_


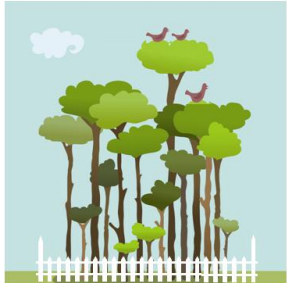
6. Please identify the number of projects involving credit stacking that you are aware of:
- a) 0
  - b) 1-2
  - c) 3-4
  - d) 5-6
  - e) 7 or more
7. What level of ecological value do you believe credit stacking provides over establishing a bank for only one credit type?
- a) Positive/Increased ecological value (increased habitat, increased water quality, reduced species risk, reduced climate impact, etc.)
  - b) Negative (decreased habitat, decreased water quality, increased species risk, increased climate impact, etc.)
  - c) No difference from a bank for only one credit type
  - d) It depends on the credit stacking scenario
  - e) I am unsure or do not know
  - f) Please explain: \_\_\_\_\_
8. From your knowledge, which of the following has been done regarding verification of the additional ecological benefits of credit stacking versus establishing a bank for only one credit type? Select all that apply and please provide references if possible:
- a) Rigorous scientific, peer-reviewed research
  - b) Non-peer-reviewed research
  - c) Regulatory approval
  - d) Third-party review
  - e) Casual observation
  - f) Nothing
  - g) I am unsure or do not know
  - h) Other \_\_\_\_\_
  - i) References \_\_\_\_\_
9. Do you expect your organization to get involved with regulating, monitoring, or tracking stacked credits in the future?
- a) Yes
  - b) No
  - c) Other \_\_\_\_\_

10. Please identify the sets of stacked credit types you expect your organization to become involved with. If more than two credits would be stacked or a relevant stacked scenario is not shown, please choose “Other” and explain.
- a) Carbon, species
  - b) Carbon, water quality
  - c) Carbon, wetland
  - d) Species, water quality
  - e) Species, wetland
  - f) Water quality, wetland
  - g) I do not expect my organization to become involved with stacked credits
  - h) Other \_\_\_\_\_
11. Please list the names of specific projects, individuals, websites, etc. where we could locate more information on projects which involved the production, purchase, trade, or sale of stacked credits.
12. Please provide any additional comments or questions you have related to credit stacking or this research effort.



*For Researchers (if Q2 = “d”):*

For purposes of this survey, **credit stacking** is defined as **establishing more than one credit on spatially overlapping areas**. Credit types include carbon, endangered species, water quality, and wetlands. Please see the image below for an example:

<b>Not Stacked</b> (Spatially Distinct)		<b>Stacked</b> (Spatially Overlapped)
1 acre forest earning carbon credits	1 acre forest earning endangered species habitat credits	1 acre forest earning both carbon credits and endangered species habitat credits
 <p>One property</p>		 <p>One property</p>
<b>Total Credits = 2</b> <b>Total Acres Mitigated = 2</b>		<b>Total Credits = 2</b> <b>Total Acres Mitigated = 1</b>

- What type(s) of ecosystem credit banking do you primarily research or track (select all that apply):
  - Carbon – (carbon dioxide and greenhouse gas related offsets)
  - Species – (endangered species habitat mitigation credits)
  - Water quality – (water quality improvement/mitigation credits)
  - Wetland – (wetland mitigation credits)
  - Other \_\_\_\_\_
- Is your organization currently involved in researching or tracking stacked credits? (Credit stacking refers to the production of two or more different types of ecosystem credits [e.g., carbon, species, wetlands, water quality] on spatially overlapping areas)
  - Yes
  - No
  - I am unsure or do not know



3. If your organization is currently involved in researching or tracking stacked credits, which stacked scenarios are under investigation? (Select all that apply):
- a) Carbon & species
  - b) Carbon & water quality
  - c) Carbon & wetland
  - d) Species & water quality
  - e) Species & wetland
  - f) Water quality & wetland
  - g) My organization is not currently involved in researching or tracking stacked credits
  - h) Other \_\_\_\_\_
4. Please identify the number of projects involving credit stacking that you are aware of:
- a) 0
  - b) 1-2
  - c) 3-4
  - d) 5-6
  - e) 7 or more
5. To your knowledge, which of the following stacking scenarios have regulations or policy guidance PENDING:
- a) Carbon & species
  - b) Carbon & water quality
  - c) Carbon & wetland
  - d) Species & water quality
  - e) Species & wetland
  - f) Water quality & wetland
  - g) I am not aware of any pending regulations or policy guidance
  - h) Other \_\_\_\_\_

6. What level of ecological value do you believe credit stacking provides over establishing a bank for only one credit type?
- a) Positive/Increased ecological value (increased habitat, increased water quality, reduced species risk, reduced climate impact, etc.)
  - b) Negative (decreased habitat, decreased water quality, increased species risk, increased climate impact, etc.)
  - c) No difference from a bank for only one credit type
  - d) It depends on the credit stacking scenario
  - e) I am unsure or do not know
  - f) Please explain: \_\_\_\_\_
7. From your knowledge, which of the following has been done regarding verification of the additional ecological benefits of credit stacking versus establishing a bank for only one credit type (select all that apply), please provide references if possible:
- a) Rigorous scientific, peer-reviewed research
  - b) Non-peer-reviewed research
  - c) Regulatory approval
  - d) Third-party review
  - e) Casual observation
  - f) Nothing
  - g) I am unsure or do not know
  - h) Other \_\_\_\_\_
  - i) References \_\_\_\_\_
8. Do you expect your organization to continue or to become involved with researching, tracking, or verifying stacked credits in the future?
- a) Yes
  - b) No
  - c) I am unsure or do not know
  - d) Other \_\_\_\_\_

9. Please identify the sets of stacked credit types you expect your organization to research or track. If more than two credits would be stacked or a relevant stacked scenario is not shown, please choose “Other” and explain.
- a) Carbon, species
  - b) Carbon, water quality
  - c) Carbon, wetland
  - d) Species, water quality
  - e) Species, wetland
  - f) Water quality, wetland
  - g) My organization is not involved in credit stacking research or tracking, and I do not expect it to become involved
  - h) Other \_\_\_\_\_
10. Please provide a brief summary on the focus of your work related to credit stacking:
11. Please list the names of specific projects, individuals, websites, etc. where we could locate more information on projects which involved the production, purchase, trade, or sale of stacked credits.
12. Please provide any additional comments or questions you have related to credit stacking or this research effort.

**For Credit Broker (if Q2 = “e”):**

For purposes of this survey, **credit stacking** is defined as **establishing more than one credit on spatially overlapping areas**. Credit types include carbon, endangered species, water quality, and wetlands. Please see the image below for an example:

<b>Not Stacked</b> (Spatially Distinct)		<b>Stacked</b> (Spatially Overlapped)
1 acre forest earning carbon credits	1 acre forest earning endangered species habitat credits	1 acre forest earning both carbon credits and endangered species habitat credits
 <p>One property</p>		 <p>One property</p>
<b>Total Credits = 2</b> <b>Total Acres Mitigated = 2</b>		<b>Total Credits = 2</b> <b>Total Acres Mitigated = 1</b>

- What type(s) of ecosystem credit banking are you primarily associated with (select all that apply):
  - Carbon (carbon dioxide and greenhouse gas related offsets)
  - Species (endangered species habitat mitigation credits)
  - Water quality (water quality improvement/mitigation credits)
  - Wetland (wetland habitat mitigation credits)
  - Other \_\_\_\_\_
- Is your organization currently involved with credit stacking? (Credit stacking refers to the production of two or more different types of ecosystem credits [e.g., carbon, species, wetlands, water quality] on spatially overlapping areas)
  - Yes
  - No
  - I am unsure or do not know

3. If your organization buys, sells, or trades stacked credits, please identify the sets of stacked credit types your organization is involved with. If more than two types of credits are involved or a relevant stacking scenario is not shown, please choose “Other” and explain.
- a) Carbon, species
  - b) Carbon, water quality
  - c) Carbon, wetland
  - d) Species, water quality
  - e) Species, wetland
  - f) Water quality, wetland
  - g) My organization is not involved with stacked credits
  - h) Other \_\_\_\_\_
4. If your organization is not currently involved with credit stacking, do you expect your organization to become involved with buying, selling, or trading stacked credits in the future?
- a) Yes
  - b) No
  - c) I am unsure or do not know
  - d) My organization is already involved with credit stacking
5. If your organization is not currently involved with credit stacking, please identify the sets of stacked credit types you expect your organization to become involved with. If more than two credits would be stacked or a relevant stacking scenario is not shown, please choose “Other” and explain.
- a) Carbon, species
  - b) Carbon, water quality
  - c) Carbon, wetland
  - d) Species, water quality
  - e) Species, wetland
  - f) Water quality, wetland
  - g) My organization is already involved with credit stacking
  - h) Other \_\_\_\_\_

6. What level of ecological value do you believe credit stacking provides over establishing a bank for only one credit type?
- a) Positive/Increased ecological value (increased habitat, increased water quality, reduced species risk, reduced climate impact, etc.)
  - b) Negative (decreased habitat, decreased water quality, increased species risk, increased climate impact, etc.)
  - c) No difference from a bank for only one credit type
  - d) It depends on the credit stacking scenario
  - e) I am unsure or do not know
  - f) Please explain: \_\_\_\_\_
7. From your knowledge, which of the following has been done regarding verification of the additional ecological benefits of credit stacking versus establishing a bank for only one credit type? Select all that apply and please provide references if possible:
- a) Rigorous scientific, peer-reviewed research
  - b) Non-peer-reviewed research
  - c) Regulatory approval
  - d) Third-party review
  - e) Casual observation
  - f) Nothing
  - g) I am unsure or do not know
  - h) Other \_\_\_\_\_
  - i) References \_\_\_\_\_
8. Please list the names of specific projects, individuals, websites, etc. where we could locate more information on projects which involved the production, purchase, trade, or sale of stacked credits.
9. Please provide any additional comments or questions you have related to credit stacking or this research effort.







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Water Quality and Watershed Protection

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