



WWA Project Narrative: “Evaluating drone and associated technologies for more efficient monitoring and restoration”

PROJECT NARRATIVE: Evaluating drone and associated technologies for more efficient monitoring and restoration

SECTION I: PURPOSE AND OBJECTIVES

Compliance monitoring of CRP contracts and evaluations of WREP easements (and development of associated management plans) are labor intensive, requiring field technicians to:

- Survey properties afoot,
- Collect data using subjective observations,
- Compile results manually,
- Compare year-over-year field changes from subjective observations,
- Plan appropriate management steps.

Drone-technology has advanced to the point of improving the speed, consistency, and objectivity of field surveys. Those advantages can improve conservation outcomes on existing NRCS contract and eased properties. Expected outcomes include:

- Increased Efficiency – drones cover large areas quickly, with time savings up to 50%.
- Costs savings – drone surveys can save up to 30% in traditional expenses.
- Improved accuracy - drone-produced high-resolution surveys, and when coupled with emerging hyperspectral analysis tools offer more precision and thoroughness, while the data can be easily compared year-over-year for significant changes.
- Enhance safety – by reduced need for field work in difficult or remote locations.

Saving effort while delivering more consistent quality data would allow limited technician and ecologist effort to shift to more productive functions. This could include developing and implementing more impactful management plans and practices, or increasing landowner engagement, or growing enrollment in NRCS conservation programs.

This proposal would outsource the development of an NRCS compliance and monitoring drone program to a current NRCS conservation partner (Wisconsin Waterfowl Association-WWA) operating under an NRCS contract to conduct CRP compliance visits and monitor WREP easements and develop management plans to address the findings.

Project Goals: This project will:

1. Validate use of drone and associated technology for use in NRCS compliance and monitoring functions for increased accuracy and enhanced efficiency.
2. Establish a drone program with a conservation partner (WWA) that can be used in NRCS compliance and monitoring function, as well as other restoration activities.
3. Continue this drone program to identify the constraints and benefits of using drone and associated technologies to support wetland restorations.
4. Deliver NRCS an implementation evaluation for consideration in expanding the benefits of this technology to other NRCS locations.



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These goals will result in efficacy data and experience on the drone-enabled efficiency and quality of NRCS monitoring functions. With a clear understanding of the value and costs, NRCS can implement programs that save time, money and produce higher quality conservation outcomes. <<<change table>>>

These project Goals...	Support the above NFO Areas of Emphasis...				...within the above Purposes of the NOFO			...to support the above NRCS Goals		
	1. Increase technical capacity to implement NRCS conservation Programs	4. Build technical capacity of NRCS partner field conservation employees	5. Build capacity of local partners	6. Achieve positive and measurable outcomes	1. Improve water quality	2. Increase soil health	3. Restore/Protect/Conserve Watershed clean / abundant / continuous water	4. Increase Carbon Sequestration	11. Build a high performing work force	
1. Validate use of drone and associated technology for use in NRCS (1) CRP compliance and (2) WREP monitoring functions for increased accuracy and enhanced efficiency.	X	X	X	X	X	X		X	X	X
2. Identify the constraints and benefits of using drone and associated technologies to support wetland restorations			X		X	X				X
3. Establish a drone program with a conservation partner (WWA) that can be used in NRCS compliance and monitoring function, as well as other restoration activities	X	X	X	X	X	X	X	X	X	X

Objectives: This project will leverage drone and associated technology to enhance accuracy, improve quality management, achieve greater efficiency, and enhance safety in important NRCS conservation functions. Specifically, the objectives are to:

1. Design, document, evaluate and establish a drone-assisted CRP contract compliance monitoring program.
2. Design, document, evaluate and establish a drone-assisted approach to monitor WREP easements and collect data to support development of management plans.
3. Evaluate the use of drone and associated technology to collect field data sufficient to make preliminary wetland restoration feasibility determinations and preliminary design.
4. Evaluate the financial and other quality benefits of establishing a drone program for these functions sufficient to inform an NRCS programmatic decision to expand drone usage.
5. Establish a drone capability with a conservation partner that can be used to implement NRCS programs more efficiently.

Key Strategies: No single organization has the functional competency, experience, standing and capacity to achieve all of the goals noted above. So, a collaborative partnership that integrates the needed competencies is the underlying strategy for this proposal. Necessary competencies include (but are not limited to):

- Project and contract management, accounting and administrative proficiency,
- Significant wetland restoration experience,
- State-of-market drone program management experience,
- State-of-the art application of software to evaluate of digitized aerial imagery, including interpretation of hyperspectral imagery,
- Program design, development, implementation and evaluation, etc.

WWA proposes to integrate a university-level academic institution, a deeply experienced drone operating commercial entity, and the state’s Department of Natural



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Resources (DNR), then manage their unique contributions to deliver the required outputs. Clearly defining the roles and expectations of each partner will be critical.

A second key strategy is the sequential phasing the task effort for each objective, rather than undertake them in parallel. In this way, the experience gained in accomplishing the first objective will inform the effort of the second phase, etc. Relevant, emerging technological advances can be incorporated in the design of subsequent phases. And NRCS can gain confidence on cost, schedule and performance in timely increments.

Project Design: Project objectives (CRP Compliance, Establish a WWA drone Program, Wetland Easement Monitoring, Application to Restorations, plus a Project wrap up) correlate to 5 discrete, sequenced phases as shown below (section III details).

Project Phase	OBJECTIVES	Deliverable?	2025				2026				2027				2028				2029			
			Q1	Q2	Q3	Q4																
1	CRP compliance	X																				
2	Establish WWA Drone program	X																				
3	Wetland Easement Monitoring	X																				
4	Application to Wetland Restorations	X																				
5	Project wrap-up	X																				

First Phase - CRP Compliance: High-level tasks are shown in the table to right. Each Phase follows a similar progression. The complete listing of high-level tasks necessary to accomplish all of the objectives is shown in section 3.

Project Phase	OE	Task	WWA	University	Contractor	DNR
1		CRP compliance				
	a	Project Initiation and ramp-up	L	S	S	x
	b	Design CRP drone operation program	S	S	L	x
	c	Design CRP aerial imagery analysis approach		L	S	x
	d	Field test CRP compliance program	L	S	S	x
	e	Evaluate and revise CRP compliance program	S	L	S	x
	f	Document and deliver complete CRP compliance package	S	L		x
	i	Produce initial video on CRP compliance phase efforts	x	x	x	x

Strategic partners and roles: As awardee, WWA will have overall project management (schedule, cost and performance). WWA will contract/sub-award to a university (UW Stevens Point) and a contractor with significant drone surveying

Partner	Partnership Contributions
WWA	Program management; Accounting; Contract Administration; Procurement; CRP compliance groundtruth; WREP monitoring ground truth; Wetland management plan development expertise; Wetland restoration groundtruth; Standing to do all of the above on CRP and WREP and candidate state wetland restoration properties.
University of Wisconsin Stevens Point (UWSP)	Project management; Evaluation - Data collection management and evaluation analysis; Interpreting digital imagery; Multi-spectral analysis application, LIDAR (et. al.,) for vegetation and soil conditions and elevation information; Ground-truth results
Contractor (TBD)	Drone operations expertise and program management; Aerial survey expertise; Program documentation ; Drone operation certification and training; consulting on remote imagery capture to support the various phases of the project
Wisconsin Department of Natural Resources	Access to state-owned property to evaluate for restoration opportunity

expertise. Each high-level task will have lead (L) and support (S) assignments for each partner. These responsibilities, along with expected deliverables and timelines will be detailed in formal agreements between WWA and its partners. The table above highlights competencies brought by strategic partners.



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SECTION II: Expected Accomplishments and Deliverables

WWA will deliver program documentation to allow NRCS to confidently implement CRP compliance and WREP monitoring using drone technology. This documentation will describe explicit and evaluated benefits of using drone technology. It will include the implementation steps and practices necessary for field technicians and conservation partners to achieve these benefits.

As part of the project deliverables, there will be:

- An implementation manual to establish a drone-facilitated program to evaluate CRP compliance.
- An implementation manual to establish a drone-facilitated program for WREP monitoring.
- A report detailing the benefits and limitations of using drone and associated technology for evaluating wetland restoration potential and preliminary designs.
- Three short videos that document each phase / outcome of the project, suitable for marketing the resulting programs.
- Evaluation data and conclusions about the benefits and limitations of using drone technology for these purposes. Note: project will be dependent on NRCS-provided baseline data (costs and level of effort) for comparative evaluation of drones vs. traditional methods.
- There will also be interim / preliminary reports as noted in the milestone section below, to provide NRCS insight to project progress and preliminary conclusions.

As a result of this project, WWA will establish a drone program and use it in its existing contract for CRP compliance and WREP monitoring services.

Also, NRCS will have the necessary data to make programmatic decisions about implementing similar programs more broadly within NRCS and with its conservation partners, harvesting the efficiencies and quality improvements that drone and Artificial Intelligence (AI) technology promise.

Finally, to the degree drones and associated technology prove beneficial in preliminary evaluation of wetland restorations, this program would be an accelerant in conducting such restorations on the patchwork quilt of landownership in the state. Such restorations have been the bread-and-butter of WWA for the past 30 years, but the effort required to evaluate and develop preliminary design for these typically small scale of the projects keeps organizations like WWA from having the watershed level impacts national wetland conservation plans demand. This project could change that equation for organizations like NRCS, WWA, Ducks Unlimited or the USFWS (Partners for Wildlife program) increasing the efficiency of the process.



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SECTION III: Milestones

Start Date: 1 October 2024

End Date 20 September 2029

The schedule below outlines the phase approach of this proposal, and the high-level tasks in each phase needed to meet the objectives. With this phased approach, NRCS will be able to clearly evaluate progress at interim points and develop confidence on the timely and successful conclusion of the project. It also shows the Lead and Support assignments for

Project Phase	Task	WWA	University	Contractor	DNR	2025				2026				2027				2028				2029			
						Q1	Q2	Q3	Q4																
1	CRP compliance																								
a	Project Initiation and ramp-up	L	S	S	x																				
b	Design CRP drone operation program	S	S	L	x																				
c	Design CRP aerial imagery analysis approach		L	S	x																				
d	Field test CRP compliance program	L	S	S	x																				
e	Evaluate and revise CRP compliance program	S	L	S	x																				
f	Document and deliver complete CRP compliance package	S	L		x																				
i	Produce initial video on CRP compliance phase efforts	x	x	x	x																				
2	Establish WWA Drone program																								
a	Establish WWA drone program	L	S	S	x																				
b	Employ WWA drone program in CRP compliance efforts	L	S		x																				
3	Wetland Easement Monitoring																								
a	Phase 2 Ramp up	L	S	S	x																				
b	Design WREP aerial monitoring approach	S	L	S	x																				
c	Field test WREP monitoring program	L	S	S	x																				
d	Evaluate and revise WREP Monitoring approach	S	L	x	x																				
e	Document and deliver complete WREP monitoring package	S	L	x	x																				
f	Employ WWA drone program in WREP monitoring efforts	L	S	x	x																				
g	Produce video on WREP monitoring phase efforts	x	x	x	x																				
4	Application to Wetland Restorations																								
a	Phase 3 ramp-up	L	S	S	S																				
b	Design restoration support approach	S	L	S	S																				
c	Field test wetland restoration support program	L	S	S	S																				
d	Evaluate and document wetland restoration support program	S	L	x	x																				
e	Employ WWA drone program to support restorations	L	S	S	S																				
f	Produce video on wetland restoration phase efforts	x	x	x	x																				
5	Project wrap-up																								
a	Analyze data derived from WWA drone usage (in all three phases)	S	L	x	x																				
b	Update and deliver compliance and monitoring packages	L	S	x	x																				
c	Develop and provide report on entire project, including restoration	S	L	x	x																				

L= Lead role
S = Support role
x = no anticipated role

each partner for each task.



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This schedule also contains the “ownership” and support assignments for each high-level task. These responsibilities and expectations will be included in the contractual relationship WWA establishes with each strategic partner.

Outputs, Deliverables and Associated Deadlines:

The table to the right shows the tasks (actions) correlating to deliverables, with a brief description and due date for each deliverable.

Note: Timeline can be accelerated at greater risk and expense.

Task	Description of deliverable	Date
Design CRP drone operation program	Implementation plan for establishing a drone program	31-Mar-26
Design CRP aerial imagery analysis approach	Interim report that provides details on the technical approach and practices needed to evaluate CRP compliance from aerial imagery	15-Jun-26
Evaluate and revise CRP compliance program	Informal evaluation of field results and proposed adjustments to interim report	31-Mar-27
Document and deliver complete CRP compliance package	Final implementation plan for using aerial imagery to evaluate CRP compliance	30-Jun-27
Produce initial video on CRP compliance phase efforts	A short (less than 3 minute) edited video with voice-over describing the project phase and results	30-Jun-27
Design WREP aerial monitoring approach	Interim report that provides details on the technical approach and practices needed to evaluate CRP compliance from aerial imagery	30-Sep-27
Evaluate and revise WREP Monitoring approach	Informal evaluation of field results and adjustments to interim report	31-Mar-28
Document and deliver complete WREP monitoring package	Final implementation plan for using aerial imagery to evaluate CRP compliance	30-Jun-28
Produce video on WREP monitoring phase efforts	A short (less than 3 minute) edited video with voice-over describing the project phase and results	30-Jun-28
Design restoration support approach	Interim report that provides details on the technical approach and practices needed to employ drone and associated technology to support preliminary evaluation and design of wetland restorations	30-Sep-28
Evaluate and document wetland restoration support program	Informal evaluation of field results and adjustments to interim report	30-Jun-29
Produce video on wetland restoration phase efforts	A short (less than 3 minute) edited video with voice-over describing the project phase and results	30-Sep-29
Analyze data derived from WWA drone usage (in all three phases)	Interim report that consolidates field results collected during project	30-Jun-29
Update and deliver compliance and monitoring packages	Final revisions to implementation plans establishing a drone program to evaluate compliance and monitoring	30-Sep-29
Develop and provide report on entire project, including restoration	Five page executive summary of the project, suitable for publishing in a non-technical, non-peer reviewed periodical.	20-Dec-29



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