



**PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM
REQUEST FOR PROPOSALS**

1
2
3 **SUBJECT:** 2024-2026 Annual Bathymetric LiDAR and Aerial Photography
4 **PROJECT NUMBER:** P24-002
5 **REQUEST DATE:** March 14, 2024
6 **CLOSING DATE:** April 17, 2024
7 **POINT OF CONTACT:** Justin Brei
8 Headwaters Corporation
9 4111 4th Ave, Suite 6
10 Kearney, NE 68845
11 breij@headwaterscorp.com
12

13 **I. OVERVIEW**

14 The Platte River Recovery Implementation Program (**Program**) was initiated on January 1, 2007
15 between Nebraska, Wyoming, and Colorado and the Department of the Interior to address
16 endangered species issues in the central and lower Platte River basin. Program “target species”
17 include the whooping crane, piping plover, interior least tern (now de-listed), and pallid
18 sturgeon. The Program has been charged with management of land and water along the central
19 Platte River to achieve management objectives for these target species.
20

21 A Governance Committee (**GC**) has been established that reviews, directs, and provides
22 oversight for activities undertaken during the Program. The GC is comprised of one
23 representative from each of the three states, three water user representatives, two representatives
24 from environmental groups, and two members representing federal agencies. Headwaters
25 Corporation serves as the Executive Director’s Office of the Program. Program staff are located
26 in Nebraska and Colorado and are responsible for assisting in carrying out the various Program-
27 related activities.
28

29 Aerial photography has been collected annually by the Program since 2007. Annual LiDAR
30 collection began in 2009. These data are integral to several of the Program’s research and
31 monitoring efforts and are our principal tools for assessing physical changes in river habitat
32 through time.
33

34 The GC submits this Request for Proposals (**RFP**) to solicit proposals from contractors to
35 acquire bathymetric LiDAR and aerial photography during the period of 2024 - 2026.
36

37 **II. PROJECT DESCRIPTION**

38 This scope of work set forth in this RFP includes three summer Program area aerial photography
39 flights and three fall/winter bathymetric LiDAR and aerial photography flights that cover the
40 entire 90-mile reach. Further background information on how the Program uses the data
41 acquired through this RFP is available in an excerpt from the Program’s Remote Geomorphology
42 and Vegetation Monitoring Protocol located in Appendix A.
43



44 **This RFP describes a multi-year program of work encompassing acquisition of aerial**
45 **imagery and LiDAR in 2024 through 2026 according to the following schedule:**

- 46
- 47 - **Summer 2024: Full Program area aerial photography**
- 48 - **Fall 2024: Bathymetric LiDAR and concurrent aerial photography**
- 49 - **Summer 2025: Full Program area aerial photography**
- 50 - **Fall 2025: Bathymetric LiDAR and concurrent aerial photography**
- 51 - **Summer 2026: Full Program area aerial photography**
- 52 - **Fall 2026: Bathymetric LiDAR and concurrent aerial photography**

53

54 **Summer imagery acquisition window is typically from mid-June to mid-July. Fall**
55 **Acquisitions window is typically from mid-October to mid-November.**

56

57 **III. SCOPE OF WORK**

58 The Program is requesting proposals from potential bidders to provide bathymetric LiDAR and
59 digital aerial imagery of the project area as described below. Minimum product specifications
60 follow:

61

62 **1) Schedule**

63 NOTE: From prior naming convention, Sub-Project 2 is the SUMMER acquisition. Sub-
64 Project 1 is the FALL acquisition. The 2024 project schedule will begin with Sub-Project 2.

65

66 a) Sub-Project 1 - Fall concurrent bathymetric LiDAR and aerial photography.

- 67 i) LiDAR and imagery will be acquired each year between October 15 and November
68 15 under low Platte River flow conditions beginning in 2024. Bidder must be flexible
69 and work with Program staff during that time to schedule flights such that river flows
70 in the project area are as low as possible (ideally under 1,000 cfs).
- 71 ii) Imagery will be acquired on cloud-free days with the sun at a sufficient angle to
72 reduce the effect of shadows from trees and structures and efforts should be made to
73 reduce sun glare on water surfaces.
- 74 iii) Imagery will be acquired in combination with LiDAR such that the imagery reflects
75 the condition of the river during the LiDAR acquisition. River conditions can change
76 daily, and imagery must be flown at least the same day, if not at the exact same time
77 as the LiDAR.
- 78 iv) The Central Platte River is subject to artificial hydrocycling from hydropower
79 operations, and close coordination and care in timing is required to acquire products
80 acceptable to the Program.
- 81 v) The acquisition area must be free of snow and ice, and extraneous environmental
82 conditions such as rain, fog or smoke should be avoided.
- 83 vi) Final delivery of Sub-Project 1 aerial imagery deliverables will be within 60 days
84 of final acquisition flight each year.
- 85 vii) Final delivery of all other Sub-Project 1 deliverables will be within 120 days of
86 final acquisition flight each year.

87



- 88 b) Sub-Project 2 – Summer aerial photography.
- 89 i) Imagery will be acquired each year between June 15 and July 15 beginning in 2024.
- 90 Bidder must be flexible and work with Program staff during that time to schedule
- 91 flights such that river flows in the project area are as close to 1,200 cfs as possible.
- 92 ii) The Central Platte River is subject to artificial hydrocycling from hydropower
- 93 operations, and close coordination and care in timing is required to acquire products
- 94 acceptable to the Program.
- 95 iii) Imagery will be acquired on cloud-free days with the sun at a sufficient angle to
- 96 reduce the effect of shadows from trees and structures and efforts should be made to
- 97 reduce sun glare on water surfaces.
- 98 iv) **Final delivery of Sub-Project 2 deliverables will be within 60 days of final**
- 99 **acquisition flight each year.**

- 100
- 101 c) Flight Cancellations
- 102 i) The Program, at its sole discretion, may choose to cancel any individual acquisition
- 103 or part of an acquisition (aerial imagery, LiDAR) over the course of the project. This
- 104 could occur if river conditions are such that the products received would not be of a
- 105 quality acceptable to the Program. If an acquisition is partially or fully cancelled, the
- 106 contract price would be adjusted and the cost of those acquisitions and products
- 107 removed.
- 108

109 **2) Project Area**

- 110 a) The area of interest for Sub-Project 1 consists of an area generally between the high
- 111 banks of the Platte River beginning near the junction of U.S. Highway 283 and Interstate
- 112 80 near Lexington, Nebraska, and extending eastward to near Chapman, Nebraska
- 113 (approximately 128 square miles). A polygon shapefile of the acquisition area is
- 114 included on the Program website ([LINK](#)) in the same location as this solicitation.
- 115 b) The area of interest for Sub-Project 2 consists of an area 3.5 miles either side of the
- 116 centerline of the Platte River beginning at the junction of U.S. Highway 283 and
- 117 Interstate 80 near Lexington, Nebraska, and extending eastward to Chapman, Nebraska
- 118 (approximately 750 square miles). A polygon shapefile of the acquisition area is
- 119 included on the Program website ([LINK](#)) in the same location as this solicitation.
- 120

121 **3) Sub-Project 1 Technical Specifications**

- 122 CIR aerial photography and bathymetric LiDAR over approximately 128 sq. mi.
- 123
- 124 a) LiDAR Technical Specifications
- 125 i) Topo-bathymetric LiDAR (green LiDAR) is required.
- 126 ii) The LiDAR data will be collected at a mean resolution of 2.3 ft (0.7 m) GSD or
- 127 better.
- 128 iii) The contractor shall ensure that the area of interest is fully and sufficiently covered
- 129 with no data voids due to gaps between flightlines or system malfunction.



- 130 iv) Data voids in the bare-earth not caused by classification of geographic features shall
131 not exceed three times the point spacing. Data voids of this size are sufficient
132 reason to reject the dataset.
- 133 v) LiDAR data should be classified using the following ASPRS Standard LiDAR
134 Point Classes:
- 135 • Class 1 – Unclassified
 - 136 • Class 2 – Ground
 - 137 • Class 7 – Low point and noise
 - 138 • Class 9 – Water
 - 139 • Class 12 – Overlap
 - 140 • Class 40 – Bathymetric Bottom
 - 141 • Class 41 – Water Surface
 - 142 • Class 45 – Water Column
- 143 (1) Class 1 will be used for feature points that are not in Classes 2, 7, 9, 12, 40, 41,
144 or 45. These typically represent returns from man-made structures, vegetation
145 etc.
- 146 (2) Class 2 will be used for feature points that represent the bare-earth.
- 147 (3) Class 7 will be used for artifacts that do not represent the ground, manmade
148 structures or vegetation. Typically these are extraneous points that are either
149 below, or well above the surface not representing any true feature.
- 150 (4) Class 9 will be used to identify NIR points found within water bodies, including
151 streams and rivers.
- 152 (5) Class 12 will be used for LiDAR points in the overlap portion of flight lines that
153 have been removed due to redundancy (if necessary).
- 154 (6) Class 40 will be used for green sensor returns that characterize the bathymetric
155 topography.
- 156 (7) Class 41 will be used for green sensor returns determined to be the water
157 surface.
- 158 (8) Class 45 will be used for green sensor returns within the water column that are
159 not the water surface or the bathymetric bottom.
- 160 (9) No points shall be deleted from the LAS files.
- 161 vi) Bare-earth classification shall adhere to the following specifications using both
162 automated and manual filtering classification routines:
- 163 • 90% of artifacts classified
 - 164 • 95% of outliers classified
 - 165 • 95% of vegetation classified
 - 166 • 98% of building classified
- 167 vii) **Special attention must be applied to the classification process due to the**
168 **geographic nature of the project area which consists of extremely flat terrain**
169 **mixed with important hydrographic characteristics. Channel geometry of**
170 **streams and drainage features must be maintained as well as the ability to**
171 **identify sand bar features within the Platte River.** Dense vegetation data voids



- 172 must also be minimized by the automatic removal process and “over smoothing”
173 due to aggressive classification must be avoided.
174 viii) Vertical accuracy for LiDAR will meet or exceed 0.3 ft (9.2 cm) RMSE (Accuracy_z
175 = 0.6 ft (0.18 m) at the 95% confidence level).
176 ix) Horizontal accuracy for LiDAR will meet or exceed 1.97 ft (0.6 m) RMSE
177 (Accuracy_r = 3.41 ft (1.04 m) at the 95% confidence level).
178 x) The vertical datum for LiDAR is NAVD88 (Geoid03), and the horizontal datum is
179 Nebraska State Plane (1983). Elevation and projection in feet.

180
181 b) Aerial Photography Technical Specifications

- 182 i) The imagery will be six-inch (0.5 ft) pixel resolution.
183 ii) The imagery will be color-infrared.
184 iii) The imagery will be ortho-rectified and seamless, and will be tone-balanced with
185 adjacent images across the project area.
186 iv) Imagery will be acquired on cloud-free days with the sun at a sufficient angle to
187 reduce the effect of shadows from trees and structures and efforts should be made to
188 reduce sun glare on water surfaces.
189 v) The imagery will be projected in Nebraska State Plane Feet (1983 datum).
190 vi) The imagery must be acquired concurrently with the LiDAR so as to reflect river
191 conditions during acquisition. The imagery must be collected at least the same day, if
192 not at the exact same time, as the LiDAR. Imagery acquired at flows significantly
193 different than that of the LiDAR acquisition may require reflight.

194 4) **Sub-Project 2 Technical Specifications**

195 Four-band aerial photography over approximately 750 sq. mi.

196 a) Aerial Photography Technical Specifications

- 197 i) The imagery will be six-inch (0.5 ft) pixel resolution.
198 ii) The imagery will be 4-band (R, G, B, NIR).
199 iii) The imagery will be ortho-rectified and seamless, and will be tone-balanced with
200 adjacent images across the project area.
201 iv) Imagery will be acquired on cloud-free days with the sun at a sufficient angle to
202 reduce the effect of shadows from trees and structures and efforts should be made to
203 reduce sun glare on water surfaces.
204 v) The imagery will be projected in Nebraska State Plane Feet (1983 datum).
205 vi) Deliverables will include both RGB and CIR products described in Section III.5.

206
207 5) **Project Deliverables**

208 All project deliverables should be processed and delivered according to the schedule in
209 Section III.1.

210
211 a) LiDAR (terrestrial and bathymetric)

- 212 i) LiDAR point data meeting or exceeding 2.3 ft (0.7 m) GSD resolution in a classified
213 LAS file format and adhering to the technical specifications in III.3 above. LAS file
214 projected to Nebraska State Plane Feet (1983 datum) and vertical reference NAVD88



- 215 feet (Geoid 03). Classified LAS file will include all LiDAR points, including first
216 and last returns.
- 217 ii) Daily reports during acquisition that display all flight lines, as well as completed
218 areas. Once acquisition is complete, a project summary report that shows time and
219 date of all flightline acquisitions. Time of day, not just the day, is important to match
220 river flow condition to acquisition.
- 221 iii) Tiling scheme shapefile for identifying LAS and DEM file locations. Tile size and
222 file size is flexible and will be discussed upon award of project.
- 223
- 224 b) Digital Elevation Model
- 225 i) Hydro-enforced and bathymetric bare-earth digital elevation model raster tiles (3-foot
226 cell size), projected in Nebraska State Plane coordinate system – elevation and
227 projection in feet.
- 228 (1) See pages 23-25 of the USGS LiDAR Base Specifications 2023 rev. A for details
229 on hydro-flattening: [https://www.usgs.gov/media/files/lidar-base-specification-](https://www.usgs.gov/media/files/lidar-base-specification-2023-rev-a)
230 [2023-rev-a](https://www.usgs.gov/media/files/lidar-base-specification-2023-rev-a). In the proposal, provide details of the software/methodology to be
231 used for this alternative.
- 232 (2) Breaklines used in the generation of the hydro-enforced and topobathymetric
233 DEM are also a required deliverable.
- 234 ii) Highest-hit (first return) digital elevation model raster (3-foot cell size). Used to
235 approximate vegetation height.
- 236 iii) Full project area mosaic of digital elevation model tiles (3-foot cell size).
- 237 iv) NOTE: Two versions of the DEM will be required. One hydro-enforced DEM for the
238 given flow conditions during the flight, and one DEM that incorporates bathymetry
239 below the water surfaces.
- 240
- 241 c) Imagery
- 242 i) Color-infrared (Sub-Project 1) and 4-band (Sub-Project 2) digital orthophotography
243 with a six-inch (0.5 ft) pixel resolution (or better), covering the entire project area
244 seamlessly and without data gaps.
- 245 ii) The imagery should be geo-referenced and provided in tiled GeoTIFF (.tif) format.
- 246 iii) Compressed imagery mosaic (.sid). Typically entire reach compiled into one mosaic,
247 but may be split due to file size. Sub-Project 2 will require both a RGB mosaic and a
248 CIR mosaic. Sub-Project 1 will be a CIR mosaic only.
- 249
- 250
- 251 d) LiDAR and Imagery
- 252 i) Shapefiles of LiDAR and aerial photography flight lines or photo centers that identify
253 the date and time of the flight line or photo center.
- 254 ii) FGDC-compliant metadata to include, but not limited to: flight dates and times, flight
255 altitude, camera system information, LiDAR system information, aircraft information,
256 imagery resolution, LiDAR point density, horizontal accuracy, post-processing
257 software and steps, and horizontal and vertical control references.



- 258 iii) All LiDAR data, photography, and supplemental products will be delivered on USB
259 external hard drives or flash drives and will become the property of the Program. All
260 media and data collected under the contract shall be the sole property of and can be
261 freely distributed by the Program. No restrictions shall be placed on the data by the
262 contractor.
- 263 e) Ground Survey
- 264 i) Proposals should discuss the ground control and survey approach for ensuring
265 accuracy of elevation and imagery deliverables. Accuracy and reporting are important
266 to the Program and emphasis will be placed on approach and discussion of ground
267 control. This includes verification of bathymetric surfaces.
- 268 ii) The Program owns several thousand acres of land across the entire acquisition area
269 and can provide access to multiple river survey areas for bathymetric LiDAR ground
270 survey verification.
- 271 iii) This is a continuing multi-year project since 2016. Year-to-year compatibility of the
272 deliverables is extremely important and post-processing and ground survey should
273 ensure that datasets are comparable year to year (i.e. immobile objects such as paved
274 roads should not report differing elevations across years).

275 **6) Permits and Clearances**

- 276
- 277 a) It is the contractor's responsibility to file all required flight plans and obtain all necessary
278 approvals to fly over and acquire aerial imagery and LiDAR in the Project area.
- 279

280 **IV. CONTRACT TERMS**

281 The selected contractor will be retained by:

282

283 Nebraska Community Foundation
284 PO Box 83107
285 Lincoln, NE 68501

286

287 Terms and conditions will be negotiated as mutually agreeable. It is understood that the
288 Governance Committee reserves the right to accept any proposal that, in its judgment, is the best
289 proposal, and to waive any irregularities in any proposal.

290

291 *Proposal costs incurred in response to this RFP will be the responsibility of the bidder. Neither*
292 *the Nebraska Community Foundation nor the Governance Committee will be liable for any costs*
293 *incurred by the bidder in the completion and submission of the proposal.*

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301 **V. SUBMISSION REQUIREMENTS**

302 All interested parties having experience providing the services listed in this RFP are requested to
303 submit a proposal.

304

305 **Instructions for Submitting Proposals**

306 *One electronic copy of your proposal must be submitted in PDF format to Justin Brei at*
307 *breij@headwaterscorp.com no later than 5:00 p.m. Central Time on Wednesday, April 17, 2024.*

308 Maximum allowable PDF size is 8MB. A proposal is late if received any time after 5:00 p.m.
309 Central Time and will not be eligible for consideration.

310

311 **Questions regarding the information contained in this RFP must be SUBMITTED IN**
312 **WRITING by 5:00 p.m. Central Time Thursday, April 11, 2024. No questions on content**
313 **can be submitted after this time. Questions and answers will be shared with all interested**
314 **parties. These can be emailed to Justin Brei at breij@headwaterscorp.com or mailed to the**
315 **address at the top of this RFP. Questions can be submitted any time before the above time**
316 **and answers may be posted intermittently to the Program website during the proposal**
317 **period. Final questions and answers will be made available on the Program website in the**
318 **location of this RFP ([LINK](#)) by EOB Friday, April 12, 2024.**

319

320 **Proposal Content**

321 Proposals must include:

322

323 **1) Technical information including:**

- 324 a. Aircraft/LiDAR/camera system details
- 325 b. Ground control/verification methodology/plan including both terrestrial and
- 326 bathymetric collection and calibration to past products.
- 327 c. Post-processing software and summary of methodology, especially bathymetric
- 328 processing.
- 329 d. Design accuracy information

330

331 **2) Relevant bathymetric LiDAR and aerial photography experience** from the last two years,
332 especially projects related to natural resources and river geomorphology. Example projects
333 should demonstrate experience collecting and processing bathymetric LiDAR in river
334 systems. Please provide a minimum of two project references including the name, location,
335 and brief summary of the projects; name, address, and phone number of the contracting
336 officer for the client; and when the project was completed.

337

338 **3) Statement of annual availability** within the acquisition window of October 15 to November
339 15 for Sub-Project 1 and June 15 to July 15 for Sub-Project 2.

340

341 **4) Estimated timeline** for activities including mobilization, acquisition and processing. Also,
342 specify the estimated flight time necessary to complete each acquisition over entire project
343 area (for planning purposes related to river operations in order to achieve lowest possible
344 flow).



345
 346 5) **Detailed firm fixed price proposal.** At minimum, project budget should itemize Sub-Project
 347 1 and Sub-Project 2 on an annual basis inclusive of any applicable taxes. **Budget will be**
 348 **considered, but contract will not be awarded solely on a lowest cost basis.** Governance
 349 Committee approval is needed before the contractor is authorized to begin implementation.
 350 A sample budget table is included for reference. A similar table should be included in the
 351 proposal.

	Summer 2024 SP2	Fall 2024 SP1	Summer 2025 SP2	Fall 2025 SP1	Summer 2026 SP2	Fall 2026 SP1
LiDAR Cost by Acquisition	NA		NA		NA	
Imagery Cost by Acquisition						

Total Project Cost

360
 361
 362
 363
 364
 365
 366 6) **Conflict of interest statement** addressing whether or not any potential conflict of interest
 367 exists between this project and other past or on-going projects, including any projects
 368 currently being conducted for the Program.
 369
 370 7) **Suspension and Debarment.** Contractor must not be suspended or debarred from receiving
 371 federal funds. Proposal must include statement of eligibility to receive federal funds and must
 372 provide contractor Dun & Bradstreet (D-U-N-S) number or other means of identification in
 373 the U.S System for Award Management site (www.sam.gov).
 374
 375 8) **Description of insurance** shall be provided with the proposal. Proof of insurance will be
 376 required before a contract is issued. Minimum insurance requirements will include
 377 \$1,000,000 general liability per occurrence.
 378

379 **VI. CONTRACTOR SELECTION**

380 The GC will appoint a selection committee to review responses to this RFP. Proposals will be
 381 reviewed and the award made to the lowest cost proposal that conforms to the specifications of
 382 this solicitation and is considered to provide the most value to the Program.
 383

384 **VII. PROGRAM PERSPECTIVE**

385 The GC of the Program has the sole discretion and reserves the right to reject any and all
 386 proposals received in response to this RFP and to cancel this solicitation if it is deemed in the
 387 best interest of the Program to do so. Issuance of this RFP in no way constitutes a commitment



388 by the Program to award a contract, or to pay contractor’s costs incurred either in the preparation
389 of a response to his RFP or during negotiations, if any, of a contract for services. The Program
390 also reserves the right to make amendments to this RFP by giving written notice to contractors,
391 and to request clarification, supplements, and additions to the information provided by a
392 contractor.

393
394 By submitting a proposal in response to his solicitation, contractors understand and agree that
395 any selection of a contractor or any decision to reject any or all responses or to establish no
396 contracts shall be at the sole discretion of the Program. To the extent authorized by law, the
397 contractor shall indemnify, save, and hold harmless the Nebraska Community Foundation, the
398 states of Colorado, Wyoming, and Nebraska, the Department of the Interior, members of the GC,
399 and the ED Office, their employees, employers, and agents, against any and all claims, damages,
400 liability, and court awards including costs, expenses, and attorney fees incurred as a result of any
401 act or omission by the contractor or its employees, agents, subcontractors, or assignees pursuant
402 to the terms of this project. Additionally, by submitting a proposal, contractors agree that they
403 waive any claim for the recovery of any costs or expenses incurred in preparing and submitting a
404 proposal.

405
406 **VIII. AVAILABLE INFORMATION**
407 A shapefile of the acquisition area for Sub-Projects 1 and 2 are available on the Program website
408 (www.platteriverprogram.org/contractors) at the same location as this RFP solicitation. A map of
409 the acquisition area is found on the last page of this solicitation.

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411

