

SCOTT COUNTY ENGINEER'S OFFICE

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JON R. BURGSTRUM, P.E.
County Engineer

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Administrative Assistant

MEMO

TO: Mahesh C. Sharma
County Administrator

FROM: Jon Burgstrum, P.E.
County Engineer

SUBJ: Authorization for County Engineer to sign Roadside Vegetation Survey Proposal

DATE: May 18, 2017

This resolution is to authorize the County Engineer to sign a proposal to complete a two year survey of Scott County Roadsides. In 2016 Lee Searles conducted the first phase of this project on our paved road system. The proposal contains a summary of what was found. The cost of last year's survey, \$7,046.50, was covered by donations from Scott County Residents. This year's survey is larger as we are looking at approximately 345 miles of gravel or dirt roads compared to 219 miles of paved roads last year. We were approved for a grant from the Living Iowa Roadway Trust Fund for \$7,000 for this year's inventory and \$2,800 for electronic and gps equipment to help with the survey. We also have pledges from residents of \$10,500 for this year which has already started to come in. The estimated cost of this year's survey is not to exceed \$10,534,24 and could likely be less depending on travel and lodging. The survey should be complete by August as indicated in the proposal.

I recommend authorization for the County Engineer to sign the proposal with Leeward Solutions LLC.

**Proposal for Vegetation Survey of County Roadways
Year Two, Level A and B Roads, Scott County, Iowa**

April 30, 2017

Prepared for Scott County Roads & Transportation Dept.

At the request of Jon Burgstrum and Curtis Lundy



Photo: Monarch on Purple Coneflower (Curtis Lundy)

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Summary of Year One

A Roadside Vegetation Survey (RVS) of Scott County, Iowa, is being conducted by Leeward Solutions, LLC, under contract with Scott County Secondary Roads Department (SCSRD). The RVS is broken into two phases, with hard-surfaced roads to be surveyed in 2016 (completed as of this writing) and gravel and B-level roads to be driven in 2017. This report contains information and conclusions based on Phase 1 (hard-surfaced roads).

The survey began on July 25, 2016, with office and field training on GPS equipment. The county GIS Department set up a data capture system with ESRI Collector software that showed quarter-mile segments on the paved roads and allowed data entry for each segment. In addition, the software allowed creation of data points with additional information, stored by latitude and longitude position with approximately 30-in. accuracy. Data consisted of dominant plant communities for each segment, native-plant species, erosion, and encroachments.

The primary method used was the “windshield survey” described in the Integrated Roadside Vegetation Management (IRVM) Technical Manual, supplemented by on-foot traverses of sites judged to have significant indigenous plant diversity. Three field personnel, Leland Searles (supervisor), Bob Bryant (vegetation consultant), and Elana Gingerich (assistant) conducted the survey using a GPS antenna, receiver, and ESRI Collector to log data points on an iPad tablet.

The results include precisely located road segments that consist of

- only or almost entirely nonnative species that require management by the SCSR, such as Autumn Olive (*Eleagnus umbellifera*), Canada Thistle, Plume Grass (*Miscanthus* sp.), Poison Hemlock (*Conium maculatum*), and others.
- stretches of pervasive exotic grasses, such as Kentucky Bluegrass (*Poa pratensis*), Reed Canarygrass (*Phalaris arundinacea*), and Smooth Brome (*Bromus inermis*) that are candidates for planting under the IRVM program.
- locations of ditch segments that have significant growth of woody shrubs and trees that could present hazards for motorists.
- native plant communities and species in the right-of-way that are substantial remnants of prairie, savannah, wetland, and woodland ecosystems. (Some 189 vascular plant species, out of a total of 270, comprise the list of observed native flora.)
- locations of actual or potential erosion, ranked by severity.
- locations of encroachments that potentially violate county or other rules or could amount to nuisances.

Numerous erosion points and bare soil patches were recorded, ranging in priority from low to high. Remarks about the position of these spots (bank below fence, ditch, bank below shoulder, shoulder) and the type of erosion will help guide prioritization for repair.

Observed encroachments were few. Their locations will aid in decisions as to whether to address them.

An important finding is the abundance of native species still extant along the secondary roads. Management of these for enhancement, local seed supply, preservation, and further study is recommended. Some species have high conservation priority in Iowa, as indicated in the species list by a Coefficient of Conservatism greater than or equal to eight (and including a few with a rank of seven). Some state-listed Endangered, Threatened, or Special Concern species were noted.

In 2017, the survey will be extended to the gravel and dirt-surfaced roads. The expectation is that the number of native species will increase somewhat, and the number of exotic species may as well. In general these roads have suffered somewhat less from physical disturbance over time, although agricultural chemicals, cropping, residents' mowing and planting of lawn, and other activities usually are just as influential on plant communities and species. In addition, the number of erosion points and encroachments may be higher, especially where roads cut across steeper slopes or where flooding from streams has occurred.



Figure 1: Sawtooth Sage (*Artemisia serrata*), found in two widespread locations in Scott County. This species is a rare inhabitant of mesic and xeric prairies, with a Coefficient of Conservatism of 10. (*Leland M. Searles*)

An Excel spreadsheet of data shows that about eighty or more road segments that were surveyed contain no data. The reason for this is not clear. At times sunlight through the vehicle windshield caused errors on the tablet computer used for data collection. While these segments were reentered after recovering from the warning, overheating may be a major reason for the lack of

data. Most notably, segments along 60th Avenue, 70th Avenue, 100th Avenue, 210th Street, Allens Grove Road, and Slopertown Road are blank. Other blank segments are more isolated and seemingly random.

Two solutions to this problem will be implemented. First, Searles has purchased a newer vehicle with more reliable air conditioning to maintain a better operating temperature for the equipment. Second, the missing data will be collected a second time in 2017 by driving these road segments during 2017. Searles will plan these into the 2017 driving routes in order to minimize the additional mileage and time required.

Experience from the survey in Marion County, conducted in 2016, informed the setup of data fields in ESRI Collector and the collection of field data. Many road segments consisted of exotic or nonnative grasses such as Smooth Brome (*Bromus inermis*) and Reed Canarygrass (*Phalaris arundinacea*). Many of these are ideal segments for IRVM plantings. Some of them also contain one or more native species, usually a common generalist species such as Common Milkweed (*Asclepias syriaca*) or Common Dogbane (*Apocynum cannabinum*). In addition, some have significant populations (coded in “Dominant” or “Major” species fields) of important prairie and wetland species, such as Rough Dropseed (*Sporobolus asper*). Plantings will more than make up for any losses of native pollinator habitat when these native species are sparse in a given segment.

A few roadsides consisted of mostly exotic forbs (broadleaved species), again with some common native plants present, and these segments are mostly ideal for replanting.

A large number of segments have mixed exotic forbs and grasses. The usual common natives exist in many of these. Some have less common native species. When these are coded as Dominant or Major Species in a segment, some care should be taken to avoid these for plantings, or to use interseeding techniques rather than reducing them to bare soil.

In addition, it is important to pay attention to species coded as Minor Species. These often have rarer native species, so this field should not lead to the assumption that a given segment is prime for IRVM management and replanting.

A second database was collected, in addition to the road segments, that provides GPS points for native plant communities of various types. When combined with the road segment database, these will aid the IRVM program in avoiding small communities in segments otherwise dominated by exotic species. These remnant communities often contain less common prairie, savannah, wetland, and woodland plants, such as Flowering Spurge and Nodding Spurge (*Euphorbia corollata* and *E. nutans*), Dotted Beebalm (*Monarda punctata*), Sensitive-Fern (*Onoclea sensibilis*), Round-Headed Bush Clover (*Lespedeza capitata*), and numerous others.

In short, a means of balancing the presence of native species, whether as isolated plants or plant populations of a single species or as remnant communities with some species diversity, needs to

be weighed against the replanting efforts of the IRVM program, the use of woody-plant control methods (especially herbicides), and the control of serious invasives such as Giant Reed (*Phragmites australis*), Japanese Knotweed (*Fallopia japonica*), Plume Grass (*Miscanthus* sp.), Poison Hemlock (*Conium maculatum*), Autumn Olive (*Eleagnus umbellata*), Queen Anne's Lace (*Daucus carota*), Wild Parsnip (*Pastinaca sativa*), and others.

Year Two: Level A and Level B Roads

The focus of efforts in 2017 will be on the unpaved roads in the county system. An exception, noted above, are those segments of paved road that have blank data from 2016. One expectation is that the number of native species should increase to a proportionally greater share of the overall species list from the survey. This expectation comes from the likelihood that more remnants have been preserved in the rights-of-way (ROWs) of the unpaved roads, due to less historical disturbance overall. This was clearly true for Marion County. A mitigating factor may be a higher proportion of cropped land in much of Scott County, compared to Marion, and the potential for greater herbicide effects on native species and plant communities.

Many details about methods, equipment, and other logistics remain unchanged from 2016, and the Goals, Methods, and Results sections of the 2016 proposal document ("Proposal for Vegetation Survey of County Roadways, Scott County, Iowa," July 17, 2016). Some changes are described next, and some important points are reiterated below.

This is potentially a very busy summer for Leeward Solutions, in part because of a number of potential clients for stream stabilization projects. It may be necessary to break the work into two time periods in order to fit it around other projects. My suggested start will be May 29 or June 1, both Mondays. I would expect to work for two to three weeks, then possibly take a break depending on other projects, and return after about two weeks. Anticipated finish for the field data collection would be about the end of July.

The field documentation setup from last summer worked well in general. The combination of ESRI Collector with programmed road segments, data fields, and point data collection capacity was more than adequate. Except for software upgrades, I anticipate using the same field equipment and methods as in 2016. I will work with Ray Weiser and Sunny Shang to refresh my knowledge of this setup.

This year's survey will concentrate on unpaved (levels A and B) roads, except as noted above. As for last year, the same types of data about native plants, invasives, encroachments, and erosion will be gathered for county use. Each field day will end with a data upload for backup and immediate accessibility. Given problems with blank segments in 2016, this daily upload to Scott County servers is a wise practice.

Based on last year's experience, I expect about four to five weeks to finish the work, depending on factors such as lost segments and Bob Bryant's availability. One concern from last year was Bob's hesitation to use the tablet and associated GPS link. He was just beginning to get the idea

when his wife was hospitalized. It would work best for the overall project if he worked with the GIS staff to refresh and practice. Otherwise his knowledge of plants and locations was very helpful.

After working with Bob and my field assistant from the Marion County Survey, I think it works best if two capable people work independently, or if a non-botanist driver is paid at a lower rate only for driving, or if the second person is a student intern who has an interest in field botany and/or plant biogeography. Because I regarded Bob as an expert, his pay rate was approximately equal to my net rate. That will remain true for 2017 for him. However, the use of a driver or student for either him or myself could result considerable savings for Scott County and Leeward Solutions. (The field assistant, Erin Gingerich, isn't available this year.)

The budget figure for 2017 survey work ranges from \$7,150 to \$10,060, with the higher figure serving as a not-to-exceed amount. Any savings due to efficiency or lower-than-expected costs will be passed onto the county. One key source of savings is to again use Wapsi Center for my lodging, pending arrangements with Dave Murcia.

Proposed Budget: Year Two, 2017

Lodging (line item amount likely can be reduced significantly) 20 nights @ \$60/night, 2017	1200.00
Meals	
Bob Bryant: 18 days @ \$8 per diem (one meal daily)	144.00
Leland Searles: 18 days @ \$15 per diem (three meals daily)	270.00
<i>Subtotal</i>	<i>414.00</i>
Transportation	
Des Moines to Scott County, round trip of 320 mi, 4x, @ \$.54/mi*	691.20
Survey mileage: est. 512 mi (320 survey mi) @ \$.54/mi	279.04
<i>Subtotal</i>	<i>970.24</i>
Personnel	
Field Survey Component	
Bob Bryant: est. 18 days @ 8 hrs/day, rate \$25/hr	3600.00
Leland Searles: est. 18 days @ 8 hrs/day, rate \$25/hr	3600.00
Data Preparation & Reporting Component	
Leland Searles: est. 15 hrs, rate \$50/hr	750.00
<i>Subtotal</i>	<i>7950.00</i>
<i>2016 Total</i>	<i>10,534.24</i>

Signatures below acknowledge acceptance of this proposal as a contract between Leeward Solutions, LLC, and Scott County, for services described herein.

Jon Burgstrum, PE, Scott County Engineer

Leland M. Searles, Leeward Solutions LLC, Contractor

THE COUNTY AUDITOR'S SIGNATURE CERTIFIES THAT
THIS RESOLUTION HAS BEEN FORMALLY APPROVED BY
THE BOARD OF SUPERVISORS ON _____
DATE

SCOTT COUNTY AUDITOR

R E S O L U T I O N

SCOTT COUNTY BOARD OF SUPERVISORS

May 18, 2017

Authorization for County Engineer to sign Roadside Vegetation Survey
Proposal

BE IT RESOLVED by the Scott County Board of Supervisors as
follows:

Section 1. That the Secondary Road Department enter into an
agreement for Phase 2 of a Roadside Vegetation survey by
Leeward Solutions for a not to exceed amount of \$10,543.24.

Section 2. That the County Engineer be authorized to sign
the agreement on behalf of the Board.

Section 3. That this resolution shall take effect
immediately.