Unity College Bear Study

Second Year Report – 2014

Jonah Gula, Mariana Rivera Rodriguez, & George Matula, Jr.
Front photo: UC016, a yearling female (photo by George Matula)
2014 Executive Summary

Initial field work for 2014 began on February 22 when the 2013 summer team and Maine Department of Inland Fisheries and Wildlife (MDIFW) biologists captured UC004 in her winter den. UC004 was the last radiocollared bear of three that had been collared in 2013. The purpose of capturing her in her den was to replace her VHF collar with a GPS/satellite collar that would allow us to more efficiently and closely monitor her movements. The successful deployment of her new collar has provided us with roughly 800 locations so far, including the location of a ground nest den she moved to after her capture.

The summer trapping season began on May 12 and ended on July 7, 2014. The summer crew consisted of eight student interns and two student leaders, one of which had graduated in May. Three of the ten students were returnees from summer 2013. The crew acquired permissions from 69 landowners to access more than 10,000 acres of land for trapping. Over the course of the summer 111 different sites (APPENDIX I) were maintained, of which 38 were trapsites and 73 were prebait sites. At one point during the season, a maximum of 32 individual traps were deployed at 21 different sites. The 57 day trapping period resulted in 14 captures of 11 different bears (3F:8M), one of which was UC004. Three females and two males were collared, though one male pulled off his collar after moving over 30 miles from his original capture site in 15 days. Two collared bears –one male and one female– were harvested in September, leaving two females (including UC004 wearing a video collar) with GPS/satellite collars.

Like last year, the study area was very flexible this summer. Sites were located as far south as Unity, as far west as Clinton, as far east as Troy, and as far north as Harmony. The northern sites were culvert traps maintained by Warden Jonathan Parker, who had seen increased bear activity in the area and was willing to help us secure as many captures as possible. Five of our 14 captures were in one culvert trap in Harmony, contributing to 20% of our total captures since the start of the study. Although DNA evidence is pending, we suspect that three of the four different bears captured at the site were related (a mother and two yearlings).

As we continue to track the movements of our collared bears we hope to identify the border of the recolonizing population, as well as substantiate the preliminary findings that females in our area have larger home ranges than in other parts of the state. Current student projects include analyses of locational data to determine habitat use, movement patterns, and activity centers.
Introduction

Thanks to the unexpected success of the 2013 trapping season, 2014 was met with great anticipation from involved students, faculty, staff, MDIFW biologists, and community members. The objective to capture and mark as many local bears as possible was the same, but ideas for additional data collection were developed from the previous year’s experiences. With six available collars for deployment, we anticipated collaring at least one male bear as an opportunity to collect data that MDIFW does not. Our trapping efforts were also expanded by the addition of a second culvert trap provided by the Student Government Association, as well as Warden Jonathan Parker’s willingness to help check and maintain traps in Harmony and Hartland. Building upon the 2013 season, we had a better grasp on activity centers, landcover, landowner relations, baits, and overall logistics.

MDIFW Support

MDIFW biologists, including Randy Cross, Kendall Marden, and Lisa Bates, contributed technically and logistically to the 2014 season. The den capture in February was orchestrated by Lisa, Kendall, and seasonal technicians Jake Feener and Mitch Jackman. We kept in close contact with Randy and Lisa as we prepared for the summer, as well as during trapping. Randy allowed Unity College Bear Study (UCBS) crew members to join him for a day of trapping in their study area as well. Wardens Jonathan Parker and Aaron Cross also provided encouragement and support. In August, MDIFW acknowledged UCBS as partners as we moved forward with the project.

Unity College Support

Unity College faculty and staff contributed many hours of their time to ensure that the study’s needs were met. Center Director Tim Peabody continued to support the study in every way, including advocacy, recruitment, and funding securement. President Stephen Mulkey, Vice President of
External Affairs Melik Khoury, Vice President of Academic Affairs Michael Evans, and Chief Financial Officer Deborah Cronin showed strong administrative support. Jennifer Whelan and Stacey Hachey supplied critical administrative assistance with purchases, as did Jill Miller and Beth Safford. Sarah Conroy helped with the hiring process of the two student leaders and Assistant Project Leaders Peggy Hogan and Christian Carlson. Kurt Anderson and Erica Hutchinson enthusiastically took on work with grant writing and fundraising for the project, and Alecia Sudmeyer worked to give the study a better presence on the college’s website. Marketing staff Mark Tardif, Kate Gilbert, and Brenda Bonneville contributed with press attention and student summer housing. Nicole Collins again helped to organize and advertise the student internship positions for the summer. Lisa Nason, Sandy Olsen, Sandra Abbott-Stout, and Alisha Ward made GPS and other equipment available from the library during the summer. Joe Saltalamachia and Debora Noone provided continued support in admissions and overall encouragement. Leigh Juskevice ordered shirts for the summer crew and helped with other purchasing. Dan LaForge, Aimee Dorval, and other maintenance staff helped with vehicle logistics, finding space for equipment, and much more. Public Safety always made themselves available to pump gas or unlock buildings for the summer crew as well.

Two new additions to the crew this year were UCBS Project Assistants Peggy Hogan and Christian Carlson. Peggy Hogan has been involved with database construction, DNA analyses, and sample organization from the beginning. This summer she continued to help with lab management and became part of the handling crew, too. Christian Carlson began work with DNA analyses and similar lab management; he also joined the handling crew and helped secure bait. Christian also collected footage for promotional videos about the study and worked to launch our official website. Both Peggy and Christian were enthusiastic about the project and contributed to every part of it; without them we would not have had a successful trapping season. Their work has continued into the semester with finalizing DNA results, updating the database, helping to secure funding, and much more. For those we have missed we thank you for your support, too.

Financial Support

Funding for the second year came from the following sources:

Unity College Instructional Budget - $40,000
Davis Conservation Foundation Grant - $10,000
Unity College Game Banquet - $5,350 for purchase of an ATV
Student Government Association (SGA) - $4,600 for purchase of a culvert trap
Venator Foundation - >$3,000 in trail cameras
Safari Club International Foundation (SCI) - $1,000
Alumni Donations – $615

The Davis Conservation Foundation Grant allowed us to purchase a Polaris Ranger UTV for more efficient prebait and trap checking, as well as transportation of personnel and handling equipment at captures. It also provided us with funds to purchase a specialized iPad system that we will use to collect field data electronically. Funds raised at the Unity College Game Banquet were used to purchase a new Polaris Sportsman 400 ATV, also providing for more efficient site checking and transportation. The SGA award allowed us to purchase a second culvert trap, which contributed greatly to our capture success. Venator Foundation showed interest and support in the study by donating 12 game cameras that are used for monitoring our prebaits and trapsites. The funding provided by the college, SCI, and alumni allowed us to purchase vital equipment, pay the summer crew, and accomplish many others things that made us successful. See APPENDIX II for more contributors.

**Student Team Support**

Thirteen student teams were active during the school year. Without the work they put in, the summer trapping season would not have been a success. See APPENDIX III for a complete list of student team volunteers.

- The **Grants Team** researched possible sources of funding and successfully received a $10,000 grant from the Davis Conservation Foundation.
- The **Documentation Team** kept track of team meeting minutes and volunteer hours as a way of showing how much work truly goes into the project.

- The **Outreach Team** maintained the Facebook page and developed flyers to distribute to the community in order to document bear sightings.

- The **Education Team**, which was newly formed, began exploring the possibilities of developing educational programs for local schools.

- The **Database Team** began construction of a database to house the immense amount of information we collect, from landowner information to biological measurements.

- The **GIS Team** organized and prepared site maps from the previous year, as well as digitized town tax maps and parcels to make landowner relations smoother for the summer crew.

- The **Biodata Team** updated and organized data collection protocols and forms.

- The **Landowner and Prebaiting Team** secured bait for trapping, contacted previous and new landowners, and began establishing prebaits to help start off the trapping season.

- The **Hair Snare Team** explored the possibility of using hair snares as a sample method during the summer, though it was decided that this method would not be used in 2014.

- The **DNA Team** worked on developing DNA protocols and analyzing DNA from the previous year’s bears in order to identify relationships as well as the unique genetics of each individual bear.

- The **Scat Team** tested analysis methods for determining diet from scats that had been collected during the previous year.

- The **Trail Camera Team** tested different camera models we had purchased and were donated to us, in order to inform purchases in the future.

- The **Radiotelemetry Team** ordered new GPS/satellite and VHF collars, as well as programmed and prepared collars for deployment during the summer.

**Presentations and Media**

Bangor Daily News reporters joined the crew at the winter den, and the capture was featured in newspapers and websites nationally. Four students presented their preliminary research with UCBS data at the 70th Annual Northeast Fish and Wildlife Conference in Portland, Maine. Jonah Gula and Niambi Mercado presented a poster titled *A preliminary comparison of female black bear home range and habitat use in Maine*; and Kari Lemelin and Elizabeth Dowler presented a poster entitled *Using satellite collars to determine activity levels of Black Bears (Ursus americanus) in Maine.*
Jonah also presented the poster at the May 2014 Unity College Student Conference and received the Conservation Award.

Animal Planet’s North Woods Law documented our first bear capture of the summer – the episode aired on October 5, 2014. Capture efforts during the summer received other press attention as well, including a feature on ABC and Fox News and a national news article through the Associated Press about the deployment of the video collar.

2014 Field Season Details

Student Crew

The 2014 summer crew was made up of ten students. Jonah Gula, Kari Lemelin (who graduated in May 2014), and Mariana Rivera Rodriguez had worked on the study in 2013 and returned this year. Jonah and Kari led two different teams that alternated shifts. Each crew had three students whose primary duties were to set and maintain prebait and trapsites. Each crew also had one student who was responsible for organizing landowner relations, data, samples, and bait. All crewmembers performed different tasks at bear captures. Jonah’s crew included Brandon Cross, Michael Robinson, Tom Barrows, and Leon Burman. Kari’s crew included Jonathan Fuller, Mariana Rivera Rodriguez, and Evan Donoso. Both crews worked vigorously to maximize the chances of capturing bears, often putting in over twelve hour work days. The entire crew was rewarded with 14 captures during which they learned to handle and collect data from bears. In addition to the opportunity to handle bears, students learned all that is involved in running a wildlife research study.

Landowner Relations

Legwork done during the late spring semester helped to jumpstart landowner relations for the trapping season. During the summer, the crew worked hard to identify additional parcels with good
bear habitat so traps could be set. Working with town tax maps, Leon and Evan spearheaded the landowner relations aspect of the project. The entire crew helped to identify which areas around Unity would be best to concentrate on; some of this knowledge was based on the previous field season and some on local bear reports. By the end of the summer, 69 landowner permissions were acquired in Burnham, Clinton, Detroit, Harmony, Hartland, Pittsfield, Troy, Unity, and Unity Township. Our rough estimates show that we were given permission to access at least 10,000 acres of land.

**Traps and Prebaits**

Bait and lures were provided by a number of supporters (APPENDIX II). Due to the low bear density of our study area, we attempted to put out as much bait and attractants as possible in order to maximize bear captures. After acquiring landowner permissions, the crew worked to set 111 sites (including those maintained by Jonathan Parker). Traps were set at 38 sites (also including the culvert traps) with at least one Aldrich cable trap at each site. The number of individual traps out at once ranged from two on our first day of trapping to 32 at the peak of the season. During the season, 73 prebait sites never had bear activity.

![In addition to Aldrich cable traps, two culvert traps were employed.](image)

**Captures to Date**

Since the beginning of the project, we have had 26 captures (including UC004’s den capture) of 18 unique bears. There have been seven captures in culvert traps, 18 in Aldrich cable traps, and one in a tree den. Of all our bear captures, 58% were located in the same tract of woods, and 23% of all captures were at the same trapsite.

During 2013, there were 11 captures of eight different bears (4F: 4M); two captures were in culvert traps and nine in Aldrich cable traps. The 2014 trapping season resulted in 14 captures of 11 different bears (3F:8M), ten of which were initial captures. Only one bear from 2013 (UC004) was
recaptured from 2013. Five captures were in a culvert trap and nine in Aldrich cable traps. Details of all captures during the project so far are found below. Unless specified, bears were captured using Aldrich cable traps.

- **UC001** was the first bear captured on the study. He was a nuisance bear captured on May 11, 2013 in a culvert trap in Newburgh and relocated to Unity. He was three years old and weighed 165 pounds.

- **UC002** was a female nuisance bear captured in Wales on May 16, 2013. Upon trying to relocate her to Unity, it was discovered that she still had cubs at the residence in Wells and was released there. Because of this and difficulty with immobilization, she was never handled. However, she had eartags from New Hampshire Fish and Game that identified her as a nine-year-old originally tagged in Pittsburgh, New Hampshire.

- **UC003** was a two-year-old female initially captured in Burnham on May 30, 2013. At an estimated 100 pounds, she was the first bear to be collared on the project. Due to her size we deployed a VHF collar. She was recaptured on June 30, 2013 and her VHF collar was replaced with a GPS/satellite collar. She was struck and killed by a vehicle on I-95 in Detroit on August 14, 2013.

- **UC004** was 54 pounds when she was originally captured as a yearling on June 4, 2013 in Unity Township. A VHF collar was deployed on her as well and she was manually tracked via radiotelemetry throughout the fall until she denned. With the help of MDIFW biologists, our crew captured her in a tree den on February 22, 2014 and replaced her VHF collar with a GPS/satellite collar. On June 30, 2014 she was recaptured in Burnham at 80 pounds. She was in estrus, too, indicating that she may have cubs this winter. A video collar that had recently been slipped by UC014 was deployed and is currently allowing us to track her movement.
• **UC005** was a two-year-old, 130-pound male initially captured in Burnham on June 5, 2013. He was recaptured twice more in Unity Township and Burnham on June 11 and June 16, 2013, respectively. On July 10, 2014 he was killed by a vehicle on I-95 in Etna.

• **UC006** was a 63-pound yearling male captured in Unity Township on June 6, 2013. Unfortunately, he was cannibalized by a larger bear and was found dead in the trap. He was suspected to be the sibling of UC004.

• **UC007** was an eleven-year-old, 150-pound female captured and collared in Burnham on June 16, 2013. She was suspected to be the mother of UC004 and UC006 due to overlapping home ranges and anecdotal information. On July 3, 2013 she was killed by a vehicle on Route 139 in Unity.

• **UC008** was a thirteen-year-old, 255-pound male captured in Unity Township on July 7, 2013. He was the last capture of the 2013 trapping season.

• **UC009** was a male captured on May 24, 2014 at our primary Harmony culvert trap. Unfortunately he recovered from the drugs before we could weigh him and pull a tooth for aging. We estimated his weight at 180 pounds.

• **UC010** was a three-year-old, 180-pound male captured in Clinton on May 25, 2014.

• **UC011** was a three-year-old, 200-pound male captured in Unity on May 28, 2014.

• **UC012** was a four-year-old, 165-pound male captured in Unity Township also on May 28, 2014.

• **UC013** was a 19-year-old, 130-pound female initially captured in the Harmony culvert trap on June 5, 2014. She was the first female to be collared during the summer, and was recaptured on June 19 in the same trap. We anticipate that she will have cubs this winter.

• **UC014** was a four-year-old, 180-pound male initially captured in Unity Township on June 5, 2014. On June 12, he was recaptured in Burnham and a video camera collar was deployed on him, making him the first male to be collared on the project. Fifteen days later, he pulled off the collar and it was retrieved in Stockton Springs—about 30 miles from his original capture site. On September 15, he was harvested in Cambridge at a dressed weight of 285 pounds.
- **UC015** was a yearling male captured in the Harmony culvert trap on June 12, 2014. Because of issues with his immobilization we were unable to collect biological data; but we were able to put in eartags and collect hair. Due to sightings of a sow with yearlings and the location of the capture, we suspect that he is the offspring of UC013. DNA from collected hair will confirm this. We estimated his weight at 70 pounds.

- **UC016** was a 65-pound yearling female captured in the Harmony culvert trap on June 22, 2014. She was the second female of the summer to be collared. We suspect she was also the offspring of UC013 based on similar evidence as well as locational data indicating that she and UC013 had significantly overlapping home ranges and frequented similar areas (APPENDIX IV). On September 12, she was harvested in Harmony at a weight of 150 pounds.

- **UC017** was a 92-pound yearling male initially captured in Burnham on June 27, 2014. When he was recaptured on July 1 in Unity Township we deployed a collar on him. He was harvested in Burnham on September 9 at 152 pounds.

- **UC018** was a five-year-old, 245-pound male captured in Unity Township on July 4, 2014, marking the last capture of the 2014 trapping season.

**Collar Deployment and Mortalities to Date**

Three females were collared during the 2013 trapping season. However, the two with GPS/satellite collars were killed by vehicles during the summer. UC004 was the only surviving collared bear from 2013, and we have been able to track her daily since she emerged from her den. During the 2014 season, five collars were deployed but, due to the loss of UC014 on the air, four collars on bears have been the most out at one time. The use of Lotek Globalstar GPS/satellite collars has provided us with over 1,300 individual locations of five unique bears so far this year. The use of these collars also allows us to view the bears’ locations in almost real time via a satellite website; this service
also allowed us to easily recover UC014’s slipped collar. A total of seven different bears have been collared since the start of the study—two males and five females (APPENDIX V). We anticipate the two remaining collared females will have cubs this winter, which will mark the first successful reproduction of UCBS bears, as well as increase our sample size.

There have been seven known mortalities—39% of our bears to date—since summer 2013 (3F: 4M), four of which were killed while wearing collars. Three were killed by vehicles (UC003, UC005, UC007), three by hunting (UC014, UC016, UC017), and one by cannibalism (UC006).

**Preliminary Findings**

In our second year of the project, we have been able to slowly and preliminarily answer certain questions about the recolonizing population in our study area. Last year we learned that the home ranges of two collared females were substantially larger than those MDIFW monitors in established populations. This year, the deployment of a GPS/satellite collar on UC004 has shown us that she too has an unusually large home range, especially when compared to MDIFW bears. The suspected mother and daughter in Harmony have had much tighter home ranges but are located only five miles from one of last year’s females. There is now question to whether or not our study area is on the border or “leading edge” of the recolonizing, low density population. As we continue to increase our sample size of females we will hopefully be able to identify this border and watch how it changes over time. Additionally, UC004 was the second two-year-old female we have captured in estrus. The two-year-old from last year, UC003, was killed by a vehicle so we were unable to see if she successfully bred. However, this winter we will see if UC004 has cubs and can confirm if females in this area are breeding earlier than in other parts of the state. Then we can begin to identify what exactly is contributing to this.

**Current Efforts**

Data and samples collected during the trapping season are continuing to be managed and organized by key personnel and student teams. New student teams have been formed to establish in-depth protocols, analyze data, and manage media; and old teams are continuing their same work. Currently several students are doing research on habitat use, movement patterns, and activity centers. Work is also going into fine-tuning data collection and organization for next year.
APPENDIX I
2014 Study Area and Sites
APPENDIX II
List of 2014 Project Contributors

• Bessey Land Company
• Bingham Land Company
• Chase Toy, Inc.
• Davis Conservation Foundation
• Edwards Family Shop’n Save
• Jason’s Butcher Shop
• LightHawk
• Maine Chapter of the Safari Club International
• Maine Department of Inland Fisheries and Wildlife
• Parson’s Small Engine
• Philip Buker
• Safari Club International Foundation
• Scott Pelletier
• Swan’s Honey
• TA’s Automotive
• Unity College Alumni
• Unity College Game Banquet
• Unity College Student Government Association
• Venator Foundation
APPENDIX III
Student Teams, Fall 2013–Spring 2014

Bio-Data – George Matula/Peggy Hogan

1. Rebecca Zerlin (Leader)
2. Niambi Mercado
3. Marianna Rivera-Rodriguez
4. Jessica Dyer
5. Makala Syas
6. Michelle Plance
7. Mariah Ramirez

Database Team – Brent Bibles

1. Eve Dietrich (Leader)
2. Katherine Cummings
3. Samantha McGarrigle
4. Katherine (Katie) Trickey
5. Ericka Buckreis
6. Jamas Branchaud

DNA – Peggy Hogan/Brent Bibles

1. Elizabeth (Libby) Orcutt (Leader)
2. Denise Mak

Documentation Team – George Matula/Lisa Bates

1. Meghan Carter (Leader)
2. Benjamin Hansknecht

Education Team – Gerry Saunders/Tom Mullin

1. Meghan Carter (Leader)
2. Tiffany DeMell
3. Brianna Johnson
4. Brittney Kunst
5. McKinley (Kiki) Bell
6. Jamas Branchaud
7. Kevin Connolly
8. Sierra Marchacos
9. Stephanie Campau
10. Rebecca Cochran
11. Neil D'Acierno
12. Elizabeth Comstock
GIS Team – Kathleen Dunckel/Brent Bibles

1. Taylor Follette (Leader)
2. Niambi Mercado
3. Aaron Schmitz
4. Katherine (Katie) Trickey
5. Eve Dietrich
6. Kaitlyn Nafziger
7. Amanda Granfield

Grants – George Matula/Lisa Bates

1. Mariana Rivera-Rodriguez (Leader)
2. Michelle Plance
3. Jonah Gula

Hair ID - Peggy Hogan

1. Laura Carhart (Leader)
2. Sarah Szirbik
3. Autumn O’Connor
4. Timothy Hill

Hair Snare – Brent Bibles

1. Leon Burman (Leader)
2. Laura Carhart
3. Andrew Carlin
4. Autumn O’Connor
5. Chelsea Thompson
6. Jeana Coppa
7. John Dietlin
8. McKinley (Kiki) Bell
9. Zachary Bissinger
10. Sarah Cantwell
11. Sarah McQuade
12. Sean Monaghan
13. Stephanie Tardiff
14. Andrew Uriati

Landowner Relations and Prebaiting – Lisa Bates/George Matula

1. Joseph Badger (Co-Leader)
2. Destiny Priest (Co-Leader)
3. Alexander Nicolato  
4. Jena (Rose) Zoller  
5. Mikala Robinson  
6. Michael Latti  
7. Tom Bednar  
8. Madison Smith  
9. Adrianna Bessenaire  
10. Alexis Yashin  
11. Jacob Gaposchkin  
12. Joseph Feeley

Outreach Team – Tom Mullin/Gerry Saunders

1. Marianna Rivera-Rodriguez (Leader)  
2. Meghan Carter (Co-Leader) Education Outreach sub team  
3. Tiffany DeMell  
4. Benjamin Hansknecht  
5. Bridget Burns  
6. Hannah Morrison  
7. Sam Pendred  
8. Rebecca Zerlin  
9. Briana Johnson

Radiotelemetry – George Matula/Lisa Bates

1. Jonah Gula (Leader)  
2. Evan Donoso  
3. Kaitlyn Nafziger  
4. Tara Tschritter  
5. Kevin Miller  
6. Cassandra Hammond  
7. Meghan Maloney  
8. Patricia Skibko
Scat Analysis – *Cheryl Fredrick/Erika Latty*

1. McKinley (Kiki) Bell (Leader)
2. Makala Syas
3. Brittany Leick
4. Madison Crane
5. Taylor Noble
6. Zeidy Candelario

Trail Camera – *Lisa Bates/George Matula/Cheryl Fredrick*

1. Alexandra Pesano (Leader)
2. Alicia Arsenault
3. Courtney Dotterweich
4. Jennifer Lawton
5. Taylor Noble
6. Tom Barrows
7. Brandon Cross
APPENDIX IV
Home Ranges of UC003, UC013, and UC016
APPENDIX V

Locational Data of All Collared Bears to Date