AGENDA

CLOUD SEEDING COMMITTEE MEETING

August 15, 2014 at 1:00 pm

Members May Participate by Phone
Idaho Fish & Game Magic Valley Regional Office
Conference Room
324 South 417 East, Suite #1, Jerome, ID 83338

C.L. "Butch" Otter
Governor

Roger W. Chase
Chairman
Pocatello
District 4

Peter Van Der Meulen
Vice-Chairman
Hailey
At Large

Bob Graham
Secretary
Bonners Ferry
District 1

Charles "Chuck" Cuddy
Orofino
At Large

Vince Alberdi
Kimberly
At Large

Jeff Raybould
St. Anthony
At Large

Albert Barker
Boise
District 2

John "Bert" Stevenson
Rupert
District 3

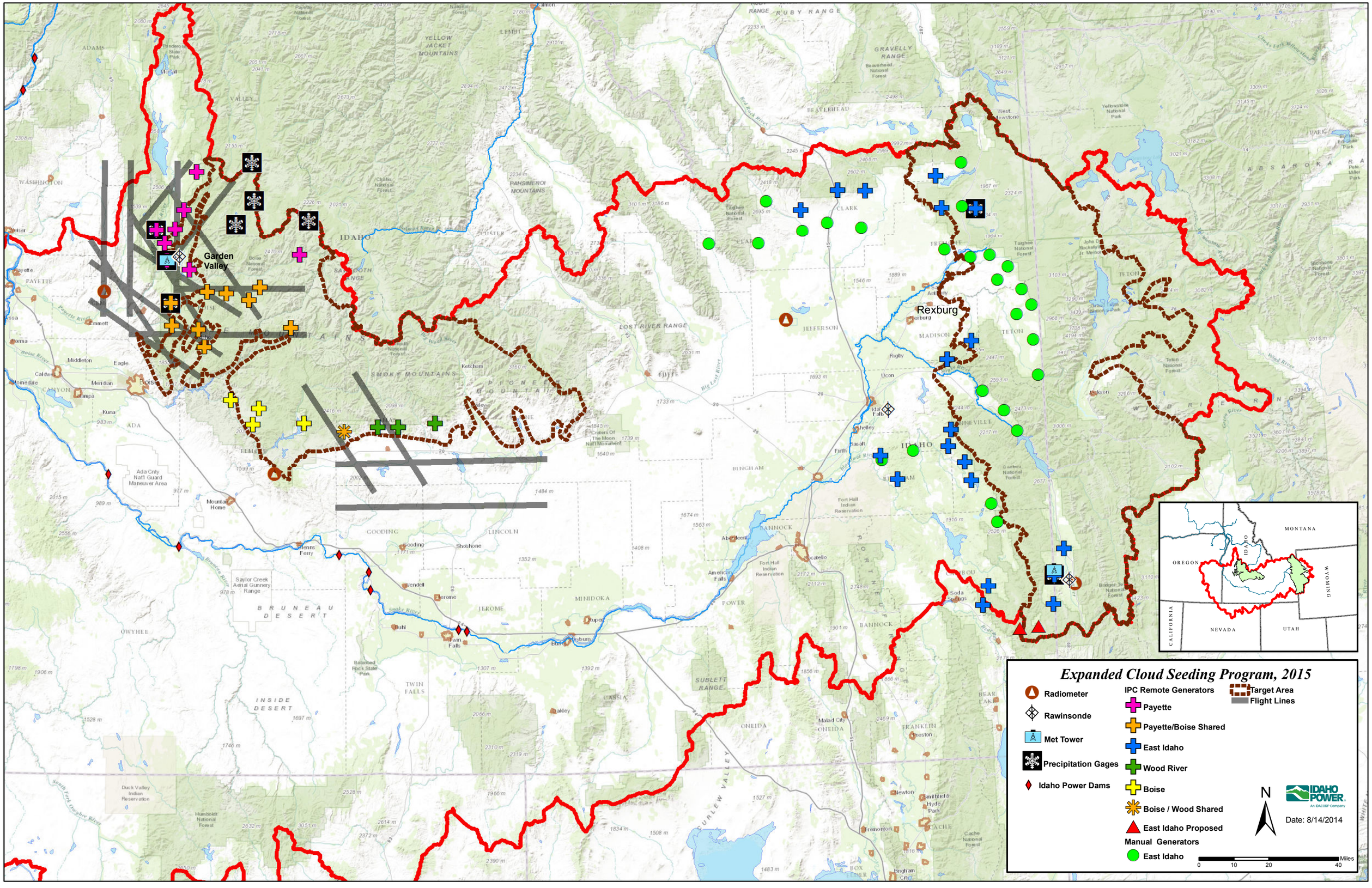
1. Introductions
2. Report by Idaho Power on current status of cloud seeding
3. Proposal for expansion of operations
4. Adjourn

Committee Members – Jeff Raybould, Peter Van Der Meulen, Vince Alberdi, John "Bert" Stevenson

Americans with Disabilities

The meeting will be held in facilities that meet the accessibility requirements of the Americans with Disabilities Act. If you require special accommodations to attend, participate in, or understand the meeting, please make advance arrangements by contacting Department staff by email Mandi.Pearson@idwr.idaho.gov or by phone at (208) 287-4800.

322 East Front Street, Boise, Idaho 83720 Tel: (208) 287-4800 Fax: (208) 287-6700


Expanded Cloud Seeding Program, 2015
Radiometer
Rawinsonde
Met Tower
Precipitation Gages
Idaho Power Dams
IPC Remote Generators
Payette
Payette/Boise Shared
East Idaho
Wood River
Boise
Boise / Wood Shared
East Idaho Proposed
Manual Generators
East Idaho
Target Area
Flight Lines
N
IDAHO POWER
An IDACORP Company
Date: 8/14/2014
0
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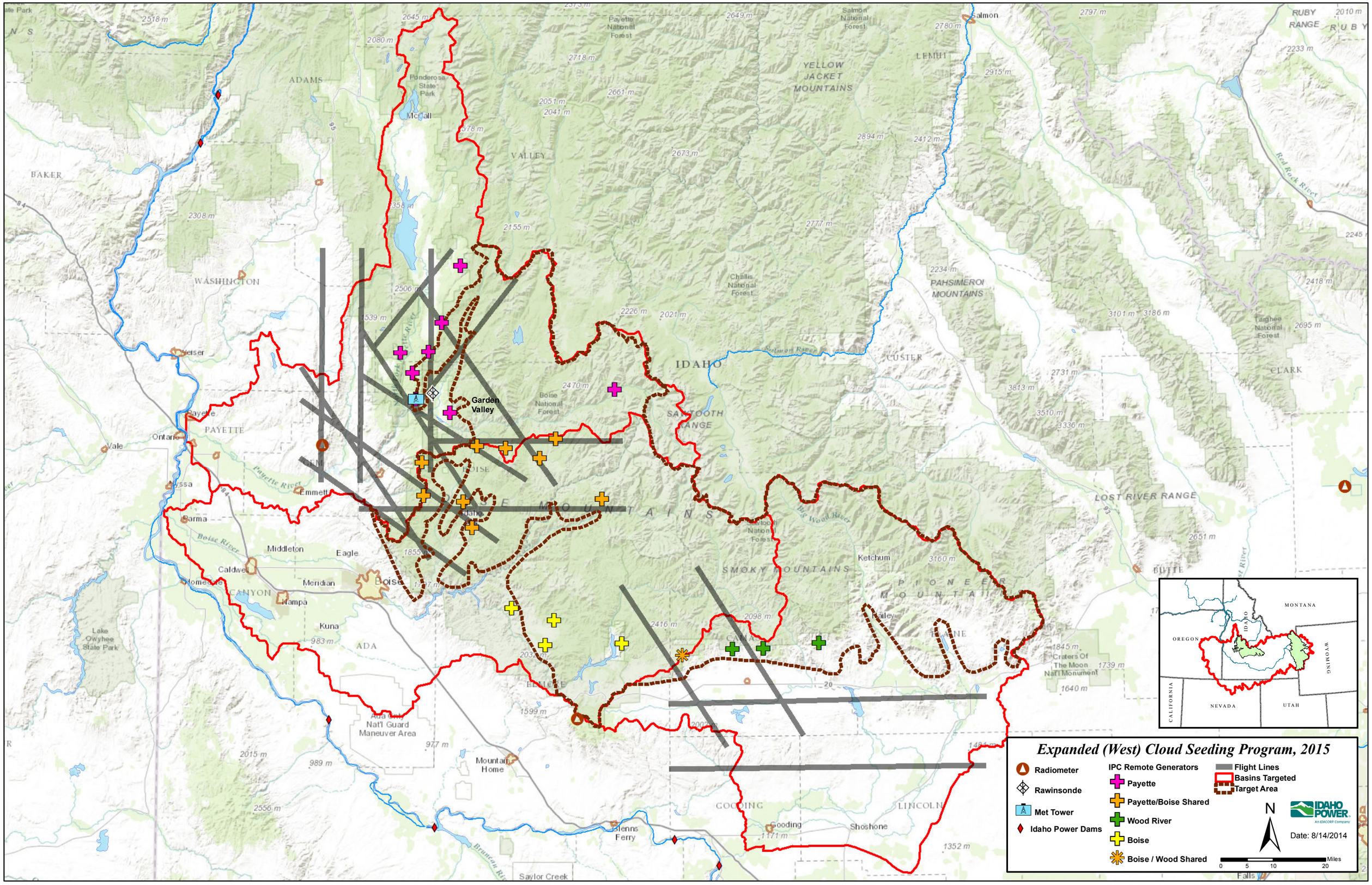
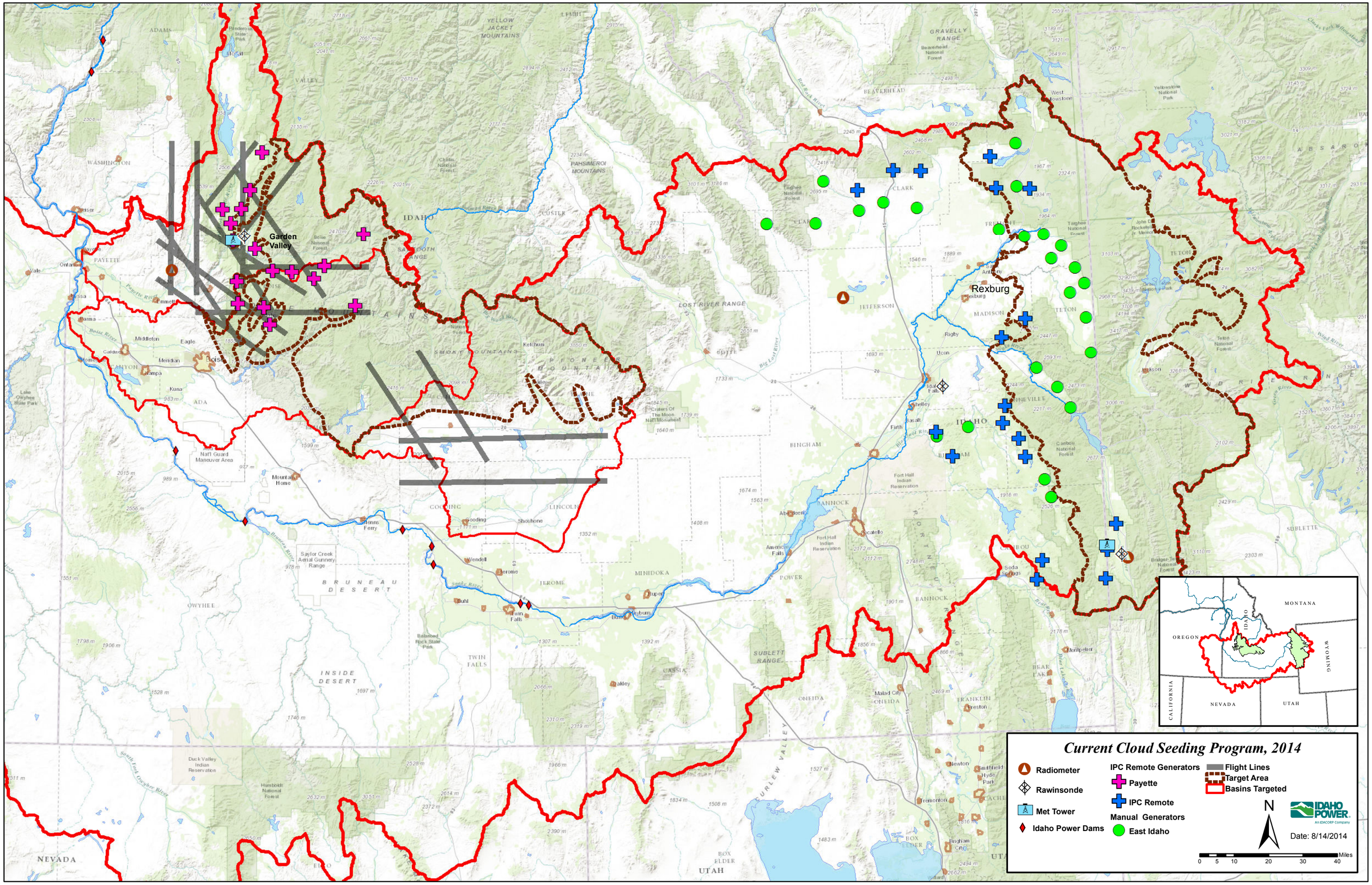
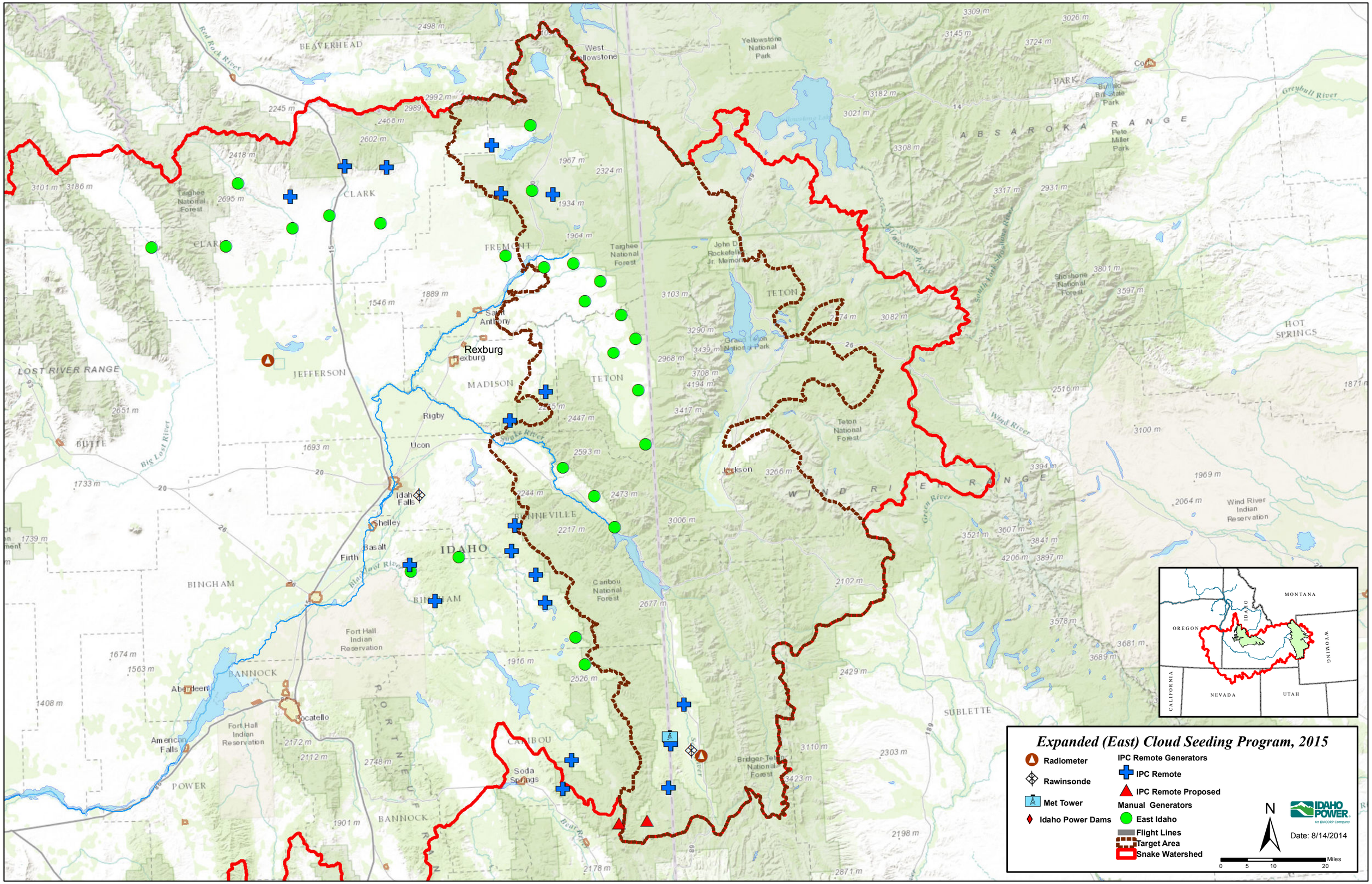
20
40
Miles
Garden Valley
Rexburg
MONTANA
OREGON
WYOMING
CALIFORNIA
NEVADA
UTAH



Expanded (West) Cloud Seeding Program, 2015
Radiometer
Rawinsonde
Met Tower
Idaho Power Dams
IPC Remote Generators
Payette
Payette/Boise Shared
Wood River
Boise
Boise / Wood Shared
Flight Lines
Basins Targeted
Target Area
N
Miles
0
5
10
20
Date: 8/14/2014
IDAHO POWER
Garden Valley
Salmon
McCall
Weiser
Payette
Ontario
Vale
Nyssa
Emmett
Parma
Middleton
Eagle
Caldwell
Meridian
Boise
Nampa
Kuna
Homedale
Lake Owyhee State Park
Ada Cnty Nat'l Guard Maneuver Area
Mountain Home
Glenns Ferry
Saylor Creek
Gooding
Shoshone
Ketchum
Hailey
Craters Of The Moon Nat'l Monument
Salmon National Forest
Payette National Forest
Challis National Forest
Boise National Forest
Targhee National Forest
Ponderosa State Park
YELLOW JACKET MOUNTAINS
PAHSIMEROI MOUNTAINS
SAWTOOTH RANGE
SMOKY MOUNTAINS
PIONEER MOUNTAINS
LOST RIVER RANGE
RUBY RANGE
ADAMS
BAKER
WASHINGTON
PAYETTE
VALLEY
IDAHO
CUSTER
LEMHI
CLARK
BUTTE
CANYON
ADA
ELMORE
GOODING
LINCOLN
MONTANA
OREGON
WYOMING
CALIFORNIA
NEVADA
UTAH


Current Cloud Seeding Program, 2014
Radiometer
Rawinsonde
Met Tower
Idaho Power Dams
IPC Remote Generators
Payette
IPC Remote
Manual Generators
East Idaho
Flight Lines
Target Area
Basins Targeted
N
Miles
0 5 10 20 30 40
Date: 8/14/2014
Garden Valley
Rexburg
IDAHO POWER
An IDACORP Company
MONTANA
OREGON
WYOMING
CALIFORNIA
NEVADA
UTAH


Expanded (East) Cloud Seeding Program, 2015
Radiometer
Rawinsonde
Met Tower
Idaho Power Dams
IPC Remote Generators
IPC Remote
IPC Remote Proposed
Manual Generators
East Idaho
Flight Lines
Target Area
Snake Watershed
N
Miles
0
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20
IDAHO POWER
An IDACORP Company
Date: 8/14/2014
MONTANA
OREGON
IDAHO
WYOMING
CALIFORNIA
NEVADA
UTAH
Rexburg
Idaho Falls
Pocatello
Rigby
Ucon
Shelley
Basalt
Firth
Aberdeen
American Falls
Soda Springs
Jackson
Cody
Yellowstone National Park
Grand Teton National Park
Targhee National Forest
Teton National Forest
Caribou National Forest
Bridger-Teton National Forest
Shoshone National Forest
Fort Hall Indian Reservation
Wind River Indian Reservation
Buffalo Bill State Park
Pete Miller Park
ABSAROKA RANGE
WIND RIVER RANGE
LOST RIVER RANGE
BEAVERHEAD
CLARK
FREMONT
JEFFERSON
MADISON
TETON
BUTTE
BINGHAM
BANNOCK
BONNEVILLE
CARIBOU
POWER
SUBLETTE
HOT SPRINGS
PARK
Red Rock River
Big Lost River
Snake River
Blackfoot River
Bear River
Wind River
Green River
Greybull River
South Fork Shoshone River
Yellowstone River

Cloud Seeding Expansion - Combined Upper Snake and Boise & Wood Basin Capital Expenses

Water Yr	Equipment for Expansion in Upper Snake			Equipment for Expansion in Boise and Wood				Total Request		
	IPC Generators	Precipitation Gauges	Capital	IPC Generators	Radiometer	Weather Balloon	Capital	Total Capital	IPC (60%)	IWRB (40%)
2015	2	2	$ 80,000	8	1	1	$ 420,000	$ 500,000	$ 300,000	$ 200,000
2016	2	2	$ 80,000	8	0	0	$ 200,000	$ 280,000	$ 168,000	$ 112,000
2017	6	0	$ 150,000	4	0	0	$ 100,000	$ 250,000	$ 150,000	$ 100,000
2018	8	0	$ 125,000	0	0	0	$ -	$ 125,000	$ 75,000	$ 50,000
2019	3	0	$ 75,000	0	0	0	$ -	$ 75,000	$ 45,000	$ 30,000

Cloud Seeding Expansion for the Upper Snake Basin (2014 Dollars)

		Remote Ground Generators (Total by year)			Radiometer (2)	Weather Balloon (2)	Aircraft (1)		Precip Gauges (4)	Forecasting &	Total	Funding Allocation, $	
		Generators in 2014, U Snake-16, Wyoming-3											
Water Yr	Type	Henry's/Teton	Salt & Wyoming Range	Cost	Cost	Cost	Fixed	Variable	Cost	Operations		IPC	IWRB
2015		16	5										
	O&M			$216,300	$1,600	$40,150	$0	$0	$2,000	$0	$260,050	$260,050	$0
	Capital			$50,000	$0	$0	$0	$0	$30,000	$0	$80,000	$48,000	$32,000
2016		16	7										
	O&M			$236,900	$1,600	$40,150	$362,000	$75,306	$4,000	$50,000	$769,956	$769,956	$0
	Capital			$50,000	$0	$0	$0	$0	$30,000	$0	$80,000	$48,000	$32,000
2017		19	10										
	O&M			$298,700	$1,600	$40,150	$362,000	$75,306	$4,000	$50,000	$831,756	$831,756	$0
	Capital			$150,000	$0	$0	$0	$0	$0	$0	$150,000	$90,000	$60,000
2018		24	10										
	O&M			$350,200	$1,600	$40,150	$362,000	$75,306	$4,000	$50,000	$883,256	$883,256	$0
	Capital			$125,000	$0	$0	$0	$0	$0	$0	$125,000	$75,000	$50,000
2019		27	10										
	O&M			$381,100	$1,600	$40,150	$362,000	$75,306	$4,000	$50,000	$914,156	$914,156	$0
	Capital			$75,000	$0	$0	$0	$0	$0	$0	$75,000	$45,000	$30,000

Cost Summary

Fixed Costs: Aircraft + Forecasting & Operations	$412,000	
Variable Costs (based on assumptions below)	$357,956	These costs will vary based seeding opportunities.

Assumptions:

Operational Season - November 1 - April 30

IWRB covers 40% of equipment costs (Generators, Precipitation Gauges)

Ground Generators

New - estimate based on approximately 50 hrs / unit, includes solution, materials, and travel (no labor).

Aircraft

Estimate based on Payette aircraft expenses.

Storms per season	20	
Flight time (season)	50	
Ejectable flares	800	
End Burning flares	180	
Fuel Cost	$6	per gallon

Radiometer

Weather Balloon

Estimate based on following costs:

Launches per season	$75	
Sondes and Helium	$166	per launch (price of helium varies)
Launch Labor	$75	per launch
Facility Rental	$2,000	per season

Forecasting and Operations

An additional aircraft will require additional meteorological support.

Collaborative Cloud Seeding Expansion for Boise & Wood Basins (2014 Dollars)

		Remote Ground Generators						Radiometer	Weather Balloon	Aircraft		Forecasting & Operations	Total	Funding Allocation, $				Funding Allocation, %			
Water Yr	Type	Payette for Boise	Boise (new)	Wood (new)	Boi/Wood Shared	Boise Cost	Wood Cost	Cost	Cost	Fixed	Variable			IPC	IWRB	Boise Basin	Wood Basin	% IPC	% IWRB	% Boise	% Wood
2015		9	4	3	1																
	O&M					$64,800	$25,200	$800	$20,075	$362,000	$75,306	$50,000	$598,181	$289,600	$0	$174,091	$134,491	48%	0%	29%	22%
	Capital					$112,500	$87,500	$200,000	$20,000	$0	$0	$0	$420,000	$252,000	$168,000	$0	$0	60%	40%	0%	0%
2016		9	6	6	4																
	O&M					$90,000	$57,600	$800	$20,075	$362,000	$75,306	$50,000	$655,781	$289,600	$0	$199,291	$166,891	44%	0%	30%	25%
	Capital					$87,500	$112,500	$0	$0	$0	$0	$0	$200,000	$120,000	$80,000	$0	$0	60%	40%	0%	0%
2017		9	8	8	4																
	O&M					$104,400	$72,000	$800	$20,075	$362,000	$75,306	$50,000	$684,581	$289,600	$0	$213,691	$181,291	42%	0%	31%	26%
	Capital					$50,000	$50,000	$0	$0	$0	$0	$0	$100,000	$60,000	$40,000	$0	$0	60%	40%	0%	0%
2018		9	8	8	4																
	O&M					$104,400	$72,000	$800	$20,075	$362,000	$75,306	$50,000	$684,581	$289,600	$0	$213,691	$181,291	42%	0%	31%	26%
	Capital					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0				
2019		9	8	8	4																
	O&M					$104,400	$72,000	$800	$20,075	$362,000	$75,306	$50,000	$684,581	$289,600	$0	$213,691	$181,291	42%	0%	31%	26%
	Capital					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0				

Cost Summary - 2015

Boise	**$174,091**	
Fixed Costs: Aircraft + Forecasting & Operations	$61,200	
Variable Costs (based on assumptions below)	$112,891	These costs will vary based seeding opportunities.
Wood	**$134,491**	
Fixed Costs: Aircraft + Forecasting & Operations	$61,200	
Variable Costs (based on assumptions below)	$73,291	

Assumptions:

Operational Season - November 1 - April 30

IWRB covers 40% of equipment costs (Radiometer, Weather Balloon, Generators)

Ground Generators

Boise & Wood (new) - estimate based on approximately 50 hrs / unit, includes solution, materials, and travel (no labor). Units may be used to target Wood River Basin under some conditions.

Payette (existing) - estimate based on approximately 25 hrs / unit targeting Boise, includes solution, materials, and travel (no labor)

Boise / Wood (shared) - these generators will essentially target both the Boise and Wood Basins, and costs are split 50%/50%.

Irrigation interests will assist in securing sites to place ground generators and data collection equipment

Aircraft

Estimate assumes Boise Basin irrigation interests (Boise Project and others) will cover 50% of variable costs (flight time, fuel, flares), and 10% of aircraft fixed costs and Wood River Basin will cover 50% of variable costs and 10% of aircraft fixed costs.

Aircraft flight tracks may be established to target the Boise and Wood Basins

Payette flight tracks may be extended to better target the Boise

Storms per season	20	
Flight time (hrs / season)	50	
Ejectable flares, season	800	
End Burning flares, season	180	
Fuel Cost	$6	per gallon

Radiometer

Estimate assumes Boise Basin irrigation interests (Boise Project and others) will cover 50% of operating costs (internet access, calibration) and Wood River Basin will cover 50%.

Weather Balloon

Estimate assumes Boise Basin irrigation interests (Boise Project and others) will cover 50% of weather balloon operating costs (launch fees, sondes, helium, facility) and Wood River Basin will cover 50%.

Launches per season	75	
Sondes and Helium	$166	per launch (price of helium varies)
Launch Labor	$75	per launch
Facility Rental	$2,000	per season

Forecasting and Operations

Estimate assumes Boise Basin irrigation interests (Boise Project and others) will cover 50% of forecasting, reporting, and operation expenses

Includes daily forecasts, compliance reporting, montly reports, annual report, operation of remote ground generators, operation of seeding aircraft