

**BEAR RIVER COMMISSION  
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WALLACE N. JIBSON

**REPORT NO. 14**

**ANALYSIS OF BEAR RIVER WATER RIGHTS,**

**WATER RIGHTS AND SUPPLIES**

**and**

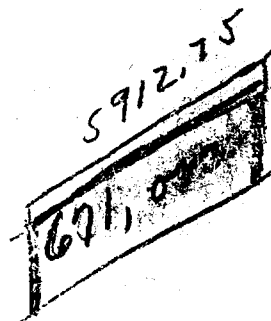
**SUGGESTED METHODS OF COMPACT APPORTIONMENT**

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Prepared By

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U. S. Geological Survey

December 16, 1950



## PREFACE

In 1943 the Geological Survey, in cooperation with the states of Idaho, Utah, and Wyoming, and the Bureau of Reclamation, began an intensive stream-flow investigation in the Bear River Basin. The purpose of this investigation was to secure adequate information on water supplies and uses within the basin as base data for a compact among the three states on the division of the waters of the river system, and to assist the Bureau of Reclamation in determining the irrigation and power potentialities of the Basin. In 1946, the states requested Mr. Leshar S. Wing, Regional Engineer of the Federal Power Commission to assist them in drafting a tentative compact and asked the Geological Survey to authorize Mr. W. V. Iorns, Project Engineer of the U. S. Geological Survey to assist Mr. Wing in this work. At the Compact Commission meeting in December 1948, the Commission appointed an Engineering Committee to assist Mr. Wing and Mr. Iorns in the study of such engineering problems as may, from time to time, be referred to the Committee by the Compact Commission. Mr. Iorns was appointed Chairman of this committee.

The states of Idaho, Utah, and Wyoming made available, in their cooperative program with the Geological Survey, funds during the 1950-51 Biennium, to the Logan Project Office for such special investigations and stream-flow analysis work as the Commission may need in the drafting of a compact.

In carrying out this assignment, much information has been collected and studied and a series of reports prepared to make a record of findings and any conclusions reached. This report is one of the series. The observations and conclusions stated herein are entirely those of the author, and do not represent in any way those of the Geological Survey, the Bureau of Reclamation, or any of the states concerned.

W. V. Iorns

## ANALYSIS OF BEAR RIVER WATER RIGHTS AND SUGGESTED RIVER DIVISIONS

The Bear River water problem is a complicated situation and as such does not lend itself to any simple solution. All phases and circumstances connected with its historical development, political subdivisions, climate, vested interests, unused potential, and social and economic life must be carefully weighed and considered. It is humanly impossible to devise any method of adjustment which would not have an adverse effect on some community or vested interest which has been allowed to reach its present status because of the existence of state boundaries and the sovereign rights of the states in dispute.

Certain sections of the basin have in connection with power developments and because of the location of geographical features received benefits in the form of supplemental storage which protects them during periods of drought. It is argued now, by some, that the size of the grant in these storage water rights has placed such a burden on the available supplies that the door is forever closed to others who wish to improve their security against times of drought. Others argue that upstream developments have deprived them of a vested right which they have long enjoyed. To now literally cancel these vested storage rights or upstream uses, would deprive almost entire communities of a vested right, which is valid under their own state laws and which has been enjoyed for more than 30 to 50 years. Such an action would not be tolerated.

Only by a careful study of water rights, available supplies, practices and uses, and the other factors can the questions be resolved. Even with these there still remain fundamental differences, the solution of which, can only be resolved by negotiation - in other words, how much one will give to another's demands in order to effect an agreement.

One of the basic principles evolving from Supreme Court decisions on interstate compacts and the rights of the States is that each State is entitled to an

equitable share of the waters of an interstate stream and that neither State can confer rights in excess of that share. If a State has by adjudications, decrees, or otherwise, conferred more than its equitable share, then no vested right is taken away by any compact apportionment, for the vested rights cannot total more than the State's equitable share.

In the determination of the equitable share of each State many factors must be considered. Where the doctrine of appropriation and priority of rights is recognized in the states involved it should be a guiding principle in arriving at the apportionment. Other factors to be also considered are: Irrigated acreage, potential development, physical and climatic conditions, the character of the supply, the consumptive use of water in the several sections of the river, the character and rate of return flows, established practice and usage, the availability of stored water, the practical effect of upstream wasteful uses on downstream areas, and the damage to upstream areas as compared to benefits to downstream areas if a limitation is placed on the former. In conjunction with all these, there should be considered the practicability of administration and regulation required by any apportionment.

A study of court decisions, compacts, and other published discussions establishes the fact that there is no exact formula for division of interstate waters. Each compact is a problem of its own. Each has been designed for its' own special case, and a compact for Bear River is no exception.

In a separate report the elements of water rights were discussed, and it was pointed out that existing rights, which have been obtained under different jurisdictions, cannot be equitably compared unless they are on, or have been placed on, the same plane of equality. In that report a common duty of water for all lands was discussed and tables prepared on this basis, leaving the dates of priority the

same as evidenced in recorded existing rights.

To fully investigate the dates of priority of the various rights would take considerable and extensive research. Lack of time and personnel have precluded anything but a limited study of this important element. However, some information has been collected and is included herein.

#### Wyoming Adjudications

In Bulletin No. 70, U. S. Department of Agriculture, Office of Experiment Stations there is presented an abstract of territorial claims to water from Bear River and tributaries in Wyoming, as on record in 1898 in the office of the State Engineer of Wyoming. This tabulation omitting the dimensions of the canals is as follows:

Date of Instrument	By Whom Signed	Amount Claimed
Dec. 19, 1871	John N. McElmore	
Apr. 4, 1874	David D. Colton	720 miner's inches
Mar. 28, 1877	Jno. W. Kerr et al	
July 8, 1878	Orlando North et al	
Aug. 5, 1879	do	
May 6, 1881	Chas. Crocker et al	
	John Slater	
	Isaac Groo	
	O. E. Snyder	
	Anthony V. Quinn et al	
July 11, 1881	Jas. Smith et al	
	Wm. P. Nee	
May 5, 1882	Jno. Fielding	200 miner's inches
Apr. 12, 1892	Brigham Barnes	1 cubic foot per second
June 13, 1891	John Burden	5½ cubic feet per second
July 1, 1891	John B. Wilson	1½ cubic feet per second
May 15, 1882	Geo. Acocks	
May 22, 1882	Jno. M. Fife	500 inches
May 27, 1882	do	
June 2, 1882	Frank Conway	1,000 cubic inches
Apr. 7, 1882	Wm. Spence	100 cubic inches
June 21, 1882	Jno. B. Wilson	
Oct. 17, 1882	Stephen A. Mills et al	
Oct. 30, 1882	Chas. Deloney et al	
Mar. 17, 1883	Reuben Fowkes	
Mar. 20, 1883	Stephen R. Glasscock	
May 24, 1883	Amos Edwards	
July 19, 1883	James Bowns et al	
July 28, 1883	Wm. Cook et al	

Date of Instrument	By Whom Signed	Amount Claimed
Oct. 8, 1883	Arthur W. Sims	
May 30, 1884	Alonzo F. Sights	
July 25, 1884	G. Christensen	
Aug. 4, 1884	Martin Christensen	
Sept. 1, 1884	James Blight	
Jan. 16, 1885	G. Christensen	
Nov. 5, 1884	Wm. Morris et al	
July 2, 1885	Wm. H. Lee	
Aug. 24, 1885	Cramer Deuel	
Oct. 20, 1885	W. H. Blanchard	
Dec. 18, 1885	John Felter	
Feb. 27, 1886	Jean Pierre Anel	
Mar. 19, 1886	Alfred A. Mott	
Mar. 25, 1886	Chambers & Whitney	
Apr. 12, 1886	A. Brown	
May 8, 1886	Thomas Baker	
May 15, 1886	Wm. Brown	
do	Enoch Turner et al	
May 19, 1886	Wm. Brown et al	
May 25, 1886	Arthur W. Sims	
May 20, 1886	Mary M. Sights	
July 20, 1886	Reuben Fowkes	
July 27, 1886	James McMahon	
Aug. 7, 1886	John A. McGraw	7 cubic feet per second
Aug. 13, 1886	Geo. F. Chapman et al	
Aug. 17, 1886	Saml. Knoder	
Aug. 23, 1886	Jno. H. Whitney	
Aug. 30, 1886	Luke Morris et al	3 cubic feet per second
Aug. 31, 1886	June Reese	2,625 cubic feet per sec.
Sept. 1, 1886	Chas. M. White	12 cubic feet per second
do	A. C. Beckwith et al	8,333 do
do	do	20,833 do
Sept. 2, 1886	Jno. W. Myers	7.65 do
Sept. 22, 1886	Jno. Wagstaff	5 do
Oct. 18, 1886	John Fearn	1,487 cubic inches
Sept. 23, 1886	H. H. Cook	15 cubic feet per second
Mar. 14, 1887	Jos. W. Cook	
June 22, 1887	H. N. Bodine et al	10 cubic feet per second
June 11, 1887	Wm. H. Wyman	8.5 do
do	do	do do
do	do	do do
Oct. 13, 1887	Jno. B. Wilson	2.5 do
Mar. 8, 1888	Jno. A. Holmes	4.5 do
Mar. 30, 1888	Geo. F. Chapman	61.20 do
Apr. 2, 1888	Jno. M. Sights	2 do
June 9, 1888	Richard Irwin	12 do
May 9, 1888	do	4 do
May 28, 1888	Frederick Coles	3½ do
June 23, 1888	Robt. M. Lewis	7.5 do
Sept. 3, 1888	J. N. Whitney	100 cubic inches
Oct. 4, 1888	Robt. M. Lewis	13.5 cubic feet per second
Nov. 10, 1888	Chas. P. Pixley	25 do
Aug. 21, 1886	Wm. Hinton	864 cubic inches per sec.

Date of Instrument	By Whom Signed	Amount Claimed
Aug. 20, 1886	Wm. Hinton	1.51 cubic feet per second
Aug. 21, 1886	do	864 " inches " "
do	do	2.125 feet
Aug. 20, 1886	do	1.125 do
Aug. 21, 1886	do	3.333 do
Jan. 24, 1889	Henry H. Stedman	9.25 do
Mar. 4, 1889	Martin V. Morse	22.5 do
Feb. 26, 1889	Jno. R. Bothwell	
Mar. 30, 1889	Wm. H. Byrne	3.5 cubic feet per second
do	do	1 do
Apr. 5, 1889	Jno. B. Wilson	6 do
Apr. 23, 1889	Jno. R. Richards	2 do
Apr. 27, 1889	Wm. Crompton	5 do
May 11, 1889	Jas. Blight	9 do
June 10, 1889	Jesse Knight	4 do
July 3, 1889	Geo. T. Dunford	1 do
July 8, 1889	John Fife	1/2 do
Aug. 5, 1889	Wm. Garrett	6 do
Sept. 26, 1889	J. F. Anel	5 do
Oct. 15, 1889	Ja. B. Bruce	3 do
Nov. 9, 1889	Henry Homer	do do
Dec. 2, 1889	Harvy Booth	40 do
Mar. 4, 1890	Wm. P. Nebeker	60 do
Apr. 24, 1890	Oscar E. Snyder	8 do
May 22, 1890	J. C. Jacobson	14 do
June 3, 1890	A. G. Richards	26 do
Aug. 2, 1890	John Titmus	24 do
Nov. 18, 1890	Bear River and Yellow Creek Irrigation & Land Co.	
Dec. 19, 1890	Robt. M. Lewis	14.5 cubic feet per second
Feb. 6, 1891	Wm. Hinton	100 do
Mar. 9, 1891	Geo. Tibbets	
July 2, 1891	Geo. Tschirgi	1,020 acres
Aug. 21, 1891	Jno. L. Russell	Mining
Nov. 27, 1891	Jonathan Jones	7,040 acres
Apr. 5, 1892	W. P. Nebeker	3,520 acres
May 2, 1899	Wm. Fearn	60 do
June 5, 1893	Augustus W. Anderson	440 do
Aug. 28, 1893	I. C. Winslow	
Aug. 1, 1895	John Felter	320 acres
Jan. 13, 1896	Jno. Cunningham, sr.	85 do
July 13, 1895	Sarah Ann Faulkner	do
Feb. 6, 1896	Wm. C. Cunningham	200 acres
May 14, 1896	Geo. Durnford, jr.	85 do
May 18, 1896	John Bruce	55 do
Nov. 2, 1896	Laban Heward	66 do
Mar. 20, 1897	Wm. Longdon	40 do
May 31, 1897	Zebulon P. Dickey et al	1,280 do
July 12, 1897	John A. McGraw	440 do
Sept. 9, 1897	Thos. S. Johnston	90 do
May 24, 1897	Mattie Lyndon	7 do
Nov. 17, 1897	Peter Dauks	19 do

Date of Instrument	By Whom Signed	Amount Claimed
Feb. 3, 1898	Jos. B. Coffman	180 acres
Feb. 19, 1892	R. C. Chambers	10,088 do
May 24, 1897	Chas. Todd	30 do
June 30, 1892	Mary Lannon	80 do
Aug. 31, 1897	R. C. Chambers	47,680 do
Oct. 13, 1898	Thos. Blyth	26 do
do	do	48 do
June 27, 1898	Laban Heward	66 do
July 9, 1898	Joseph Bird	2,732 do
May 22, 1899	Thos. Cowlshaw	300 do

A number of names of the persons signing these claims, and dates of priority can be identified with the appropriators and dates as now appear in the present tabulation of Wyoming adjudications.

There have been claims that the Wyoming book of adjudications printed in 1944 contains many changes and additions when compared with the printed book published in 1926. A careful examination of the listings of rights from Bear River and Smiths Fork was made and the following comments on differences are noted:

Hilliard West Side Canal - Bear River

Priority date changed from 8-24-04 to 11-27-91. This by ruling of Board of Control as it was an ammendment to Permit 183. However, this is a Utah Ditch and present listed claims in Utah show 517 acres of 1891 and 1,529 acres of 1893.

Bear Canal - Bear River

Lionel Lester and John Stacy of 30 acres and 29 acres were apparently missed when 1926 book was made up.

Chapman Canal - Bear River

Deseret Land & Livestock Company - 5/3/12 for 239.8 acres and 5/21/12 of 796.3 acres were apparently missed when 1926 book was made up.

Perry & Partridge Canal - Smiths Fork

James W. Chrisman - 2/28/03 for 90 acres and Nels P. Nelson



2/28/03 for 52 acres were apparently missed as they are both included on Permit No. 998E, for which only A. N. Gardner et al was listed in the 1926 book.

North Cokeville Canal - Smiths Fork

Permit No. 10816 listed as priority 6/1/11 in 1926 book was changed to 7-18-88 by order to Supreme Court.

Emelle Canal - Smiths Fork

G. K. Murdock Permit 6810 - 7/7/05 for 160 acres probably missed when 1926 book printed.

Perry & Partridge Canal - Smiths Fork

J. W. Chrisman Permit 1745E - 1/24/07 for 112 acres probably missed as other users under same permit are shown.

Covey Canal - Smiths Fork

Why a number of users under permit 9120 - 6/9/09 totaling 1,682.75 acres were not included in the 1926 book is not known. It is to be noted that of this acreage 545.40 acres also receive water from Bear River and Leeds Creek of an earlier dated priority. It is to be noted that in the listing of rights prepared by the Logan Office this duplicated 545.40 acres were excluded.

Extract from letter Earl Lloyd to Borgquist - 6/14/44

"About ten years ago the Board of Control changed the priority of Permit No. 6276, which covers these ditches (Hilliard West Side) to November 27, 1891. It was shown that Permit No. 6276 was really an amendment of Permit No. 183 with priority of Nov. 27, 1891. Therefore, the appropriations through these ditches under Permit No. 6276 now carry that priority date."

On the basis of the examination which has been made, though rather limited in extent, the author is inclined to accept the Wyoming Adjudications relative to dates of priority as being reasonably correct as to the time that the water was put to beneficial use.

#### Idaho Decrees

On March 7, 1924, District Judge Robert M. Terrell of the Fifth Judicial District of the State of Idaho, ruled on the division of the waters of Bear River between Border and Stewart Dam. This was in settlement of a suit instituted by the Preston-Montpelier Irrigation Company against the Dingle Irrigation Company and others. This decree was not the result of hearings and trial by the court, but a stipulated agreement between those representing the water-users. As stated in the decree " - - - On the 4th day of August, 1923, a stipulation of facts was entered into, signed and filed herein, which it was agreed between the parties, that it should be and the same is hereby adopted as the findings of fact herein - - -."

An examination of the early affidavits, cross complaints and answers in connection with the suit on file at Paris, Idaho was made and the following brief notes were prepared. From a knowledge of the names and lands involved an attempt was made to work out a corrected schedule which are shown in parenthesis and initialed.

Notes on early affidavits, cross complaints and answers in water suit  
Montpelier Preston Irrigation Company vs. Dingle Irrigation Co., et al.

Miller Canal

Hyrum Esterholdt - Canal was constructed in spring of 1880 and land placed under irrigation the same summer about 180 acres.

Joseph Esterholdt - Canal was constructed in spring of 1880 and water diverted for 120 acres.

John O. Miller - Started using water April 1, 1884.

(300 ac. 1880  
(378 ac. 1884 - W.V.I.)

Nuffer Canal

Carrie Hill - Began diverting in 1879.

J.A.C. Nielson - Cross complaint, does not show date use started.

(1,230 ac. 1879 - W.V.I.)

Pacific Canal

Ola Transtrum - Canal built and began using water in 1879.

(430 ac. 1879 - W.V.I.)

*Transtrum*

Lloyd Canal

(560 ac 1879 - W.V.I.)

Ezra J. Phelps - Dam and Canal built during summer of 1887 and began using water Dec. 1, 1887 on 260 acres.

(300 ac. 1887 - W.V.I.)

Phelps Estate Canal

John H. Jensen - Has used water since 1879.

George A. Sparks - Started diverting water April 1, 1890.

(290 ac. 1879  
(160 ac. 1890 - W.V.I.)

Dingle Irrigation - Canal was surveyed by Oregon Short Line R.R. surveyors at same time they surveyed railroad in 1881. Canal construction was started in fall of 1881 and completed in 1882. Started using water in 1882. Canal enlarged and extended in 1883 and 1884.

(931 ac. 1882  
(512 ac. 1883  
(278 ac. 1884 - W.V.I.)

Ream Crockett - Dam at ditches constructed in 1886 and 1887. Diversion started in 1887.

(2,500 ac. 1887 - W.V.I.)

Black Otter & Peg Leg

Grimmett Black <sup>Otter</sup> /- In 1876 constructed a dam and headgates  $1\frac{1}{2}$  miles from inlet of slough from river and put 650 acres under water. (Believed to be Grimmett lands - W.V.I.)

Cross complaint claims 133 c.f.s. beginning and used since 1872. (It is believed this is based on natural flooding and hay was cut from flooded swales after they had dried up. - W.V.I.)

Peg Leg Claimed to have started using water in 1873. In 1875 constructed dam in outlet of Black Otter Slough to Bear River. Claimed 70 cfs in use since 1875.

(4,434 ac. 1877  
396 ac. 1878  
322 ac. 1883  
149 ac. 1884 - W.V.I.)

Montpelier-Preston - Apparently a small high water ditch constructed about 1865 down to Wardboro. Enlarged somewhat between 1865 and 1885. Dam built and present higher canal dug in 1889, 1890 and 1891.

(600 ac. 1877  
2,600 ac. 1891 - W.V.I.)

Kent Larocco

Continental Life Ins. Co. - First claimed a date of priority of Apr. 1, 1884 and later changed to Feb. 10, 1881.

(732 ac. 1884 - W.V.I.)

Pugmire

Claimed used water since 1873. Date of priority asked May 15, 1874.

(232 ac. 1873 - W.V.I.)

West Fork Canal

Claimed to have used 200 cfs. by natural overflow in 1870. About 1874

parts of lands not sufficiently watered and dams and ditches put in along West Fork and Middle Channel of Bear River. In 1879 placed a dam in Main or East Channel and in all irrigated 5,000 acres.

(2,000 ac. 1870  
2,000 ac. 1874  
1,330 ac. 1879 - W.V.I.)

As indicated by the acreage and probable dates of priority, the following tabulation has been prepared, assigning a duty of water of one second foot for each 50 acres of land.

<u>Year</u>	<u>Amount 1 Sec.-ft. per 50 ac.</u>	<u>Accum. Sec.-Ft.</u>
1870	40.00	40.00
1873	4.64	44.64
1874	40.00	84.64
1877	100.68	185.32
1878	7.92	193.24
1879	76.80 - OK	270.04
1880	6.00	276.04
1882	18.60	294.64
1883	16.68	311.32
1884	30.74	342.06
1887	56.00	398.06
1890	3.20	401.26
1891	52.00	453.26

On July 14, 1920, Judge Frank S. Dietrich, of the District Court of the United States for the District of Idaho, Eastern Division, ruled on the division of the waters of Bear River between Stewart Dam and Idaho-Utah State Line. ~~Border and Stewart Dam.~~ The dates of priority as evidenced in this decree are believed to be correct as to time the water was put to beneficial use, except for the canals diverting at Cutler Dam and the Last Chance Canal, where date of application of filing to divert water was used instead of date that water was actually put to beneficial use. There is believed to have been a lapse of a few years before diversion actually started.

#### Utah Water Users Claims

Until these claims have been finally adjudicated, they probably should not be considered as comparable to the Wyoming adjudications and the Idaho decrees,

since the courts may make some changes. It is felt, however, that the present day adjudication of the rights in Utah gives that section some advantage over the adjoining Wyoming sections where the rights have been for a long time on record. It is believed that many of the canals were first built of considerably smaller capacity than they carry at the present time. Over a considerable number of years the canals were gradually increased in size and more land placed under irrigation, but the dates now claimed is believed to coincide with the date that the first segment of land was placed under irrigation.

This section and the adjoining Wyoming sections were located along old western migration routes and have much the same climate and topography and are believed to have been settled at about the same time and rate. It is also to be noted that a few of the interstate canals which have headings in Utah were also adjudicated in Wyoming. In most cases the Utah claims differ from those shown in the Wyoming adjudications.

G. K. Gilbert reported in 1878 in the Powell report - - "Where the river next enters Utah it runs for 30 miles through an open valley, the valley that contains the towns of Woodruff and Randolph." Both of these towns were located on tributaries, Woodruff Creek and Big Creek. Undoubtedly at this time most of the waters of these two streams were being diverted for irrigation. The date of claimed priority for Big Creek is 1870, while that of Woodruff Creek is 1884. It would appear that the Woodruff Creek water users are entitled to an earlier date of priority than they are claiming.

#### Suggested River Divisions

To make any attempt to re-schedule the recorded dates of priority is beyond the scope of this analysis, but the foregoing discussion on water rights should be kept in mind in any endeavor to weigh the rights of one state section of the river against another.

A study was made using 1944 and 1946 supplies, in which the entire river was operated as a unit on a strictly priority of right basis. Return flows were based on amounts of water applied in the various areas. Canals were allowed their full decrees, but not exceeding the decree while their priority was good. The study showed that at no time in those two years was it necessary to cut a right on the main stem of the river above the mouth of Smiths Fork to supply water for an older right downstream. Supplies were sufficient in the downstream divisions to fill rights of later dated priority than could be filled in the upstream division. This indicates that the main river above Smiths Fork can be operated separate from the balance of the river so long as canals are limited to their rights. This division of the river basin above the mouth of Smiths Fork is further borne out by the observation of Clarence T. Johnston in the Department of Agriculture 1898 report, - - "The scarcity experienced by the appropriators living between the head of the stream and the mouth of Smiths Fork has led to considerable uneasiness and to a desire for an interstate adjudication of priorities by appropriators below, - - - - During the past six years there have been a number of seasons when the stream was drained as dry as in 1898, when only defective dams prevented a dry channel."

The same circumstances prevailed for the division of the river from the mouth of Smiths Fork, and including Smiths Fork, to Stewart Dam in its relation to the lower river division below Stewart Dam.

While water supplies in these two years were about normal, it is believed a low water year would show the same results, using present recorded water rights and applying the same duty of water in each state.

Considering these river system characteristics, in the relation of water supply and priority of rights, together with other factors and administrative features involved, the river system can be divided into three major divisions, with boundaries defined as follows:

1. "Upper Division," that portion of the Bear River basin above the mouth of Smiths Fork.
2. "Middle Division," that portion of the Bear River basin, including Smiths Fork basin, between the mouth of Smiths Fork and Stewart Dam.
3. "Lower Division," that portion of the Bear River Basin below Stewart Dam and including Bear Lake.

It is to be noted in these major river basin divisions that only two states are involved in each case. This break down of the basin considerably simplifies working out an apportionment to the states. It must be kept in mind however, that it holds only so long as a reasonable top limit is kept on the maximum diversion rates in the upstream divisions.

#### Upper Division

The States of Wyoming and Utah are involved in the Upper Division. A study of the canal systems and irrigated lands in this section shows it can be further subdivided into four sections closely conforming to state lines as follows:

- A. "Upper Utah Section," that portion of the Upper Division in Summit County, Utah except Mill Creek and Yellow Creek drainages.
- B. "Upper Wyoming Section," that portion of the Upper Division in Uinta County, Wyoming, including Mill Creek and Yellow Creek drainages and the area in Rich County, Utah irrigated from the Chapman Canal, but excluding lands under the Bear River and Francis Lee canals.
- C. "Middle Utah Section," that portion of the Upper Division in Rich County, Utah, including areas under the Bear River and Francis Lee canals in Uinta County, Wyoming and including areas in Lincoln County, Wyoming under the Beckwith Quinn West Side Canal, but excluding area under the Chapman Canal in Rich County, Utah.



D. "Middle Wyoming Section," that portion of the Upper Division in Lincoln County, Wyoming, above the mouth of Smiths Fork but excluding lands under the Beckwith Quinn West Side Canal and land irrigated from Smiths Fork.

The deviations from state lines are for administrative and control purposes. It is necessary to include some interstate canals and tributaries under the administration of the State in which their lands are either all, or principally located.

The Hilliard East Fork, Lannon, and Hilliard West Side canals all divert in Utah but serve lands entirely in Wyoming. As these are interstate canals it is only logical that they be included with other Wyoming canals in the Upper Wyoming Section.

The tributary streams Mill Creek and Yellow Creek irrigate small areas in Utah but most of the lands irrigated are in Wyoming, consequently the administration of these streams should be included in the Upper Wyoming Section.

The Chapman Canal supplies water for storage in Neponset Reservoir and for lands in Utah, and in addition, serve considerable lands in Wyoming. This canal has been placed in the Upper Wyoming section, but it may require some special provision, providing for delivery of water to the reservoir and to Utah lands because of some question regarding its water right.

The Francis Lee and Bear River canals divert immediately below Woodruff Narrows, serve small segments of land in Wyoming, then cross the State line and irrigate large acreages in Utah. As the Narrows is a natural division point, these canals have been placed under the administration of the Middle Utah Section.

The Beckwith Quinn West Side Canal diverts in Utah and waters lands in both Utah and Wyoming. The lands of this canal are included in the Middle-Utah Section.

### Middle Division

The states of Wyoming and Idaho are involved in the Middle Division. This division can be subdivided into State sections as follows:

- A. "Lower Wyoming Section," that portion of the Middle Division in Lincoln County, Wyoming below the mouth of Smiths Fork and including all lands irrigated from Smiths Fork and including lands under the Cook Canal in Idaho.
- B. "Upper Idaho Section," that portion of the Middle Division in Bear Lake County, Idaho excluding the Rainbow Canal, but including areas irrigated by canals diverting at or above Stewart Dam and including Thomas Fork drainage, and excluding lands under the Cook Canal.

### Lower Division

The States of Idaho and Utah are involved in the Lower Division. Excluding the Malad River drainage, this section can be subdivided as follows:

- A. "Lower Idaho Section," that portion of the Lower Division above the Utah Idaho State line, but including areas in Cache County, Utah served by the west Cache and Cub River Pump canals and including Rainbow Canal and Dingle Inlet.
- B. "Lower Utah Section," areas in Cache and Box Elder Counties, Utah in the Lower Division excluding lands served by the Cache Canal and the Cub River Pump Canal.

### Effect of Diversions from Tributaries on Downstream Rights

When the first settlers moved into the Bear River Basin they took up lands along the tributaries before attacking the waters of the main river. Water rights on tributaries therefore are for the most part earlier dated than those on the main stem of the river. A study was made of supplies and rights on the tributaries as compared to supplies and rights on the main stem of the river. This study showed that for the conditions as existing in 1944 and 1945, supplies available in the

tributaries necessitated cutting rights to an earlier dated priority than in effect on the main stem of the river downstream from the tributary, except in a few cases. The amount of water involved and the period it was available in these excepted cases were of small consequence except for Smiths Fork. The conclusion reached in that study was that an apportionment between the states should be based on the supplies and rights on main stem of the river and Smiths Fork. This conclusion is based on the lands presently irrigated from the tributaries and developments as they now exist on the tributaries. Additional storage on tributaries or an increase in acreage would upset this balance.

#### Comparison of Existing Rights on the Main Stem of Bear River and Smiths Fork

If the recorded water rights are segregated as to division and state sections as previously outlined, a comparison can be made and the rights of the states weighed one against another. The combined tables on Plate 1 show the water rights and accumulated water rights for each section in the Upper and Middle divisions. On Plate 2 are shown the accumulative rights for all of the river sections and the accumulative rights for the river divisions. This table segregates the lower Idaho section into two sub-sections and does not include rights in the Lower Division below Cutler Dam. In the Upper Division the Upper Utah Section has been omitted.

On Plates 3 and 4 the accumulative rights in each section are shown plotted against the accumulative rights in each division for the two divisions above Stewart Dam. For the time being the lines designated "compact allocations" can be ignored.

These plates graphically show the relation of the recorded rights of the various state river sections as they would apply to available supplies in the two river divisions. For instance, taking Plate ~~2~~<sup>2</sup>, if 1,189 second feet were available to be divided on a priority basis in the upper division the Upper Wyoming division would be entitled to 487 second feet, the Middle Utah Section 542 second feet, and

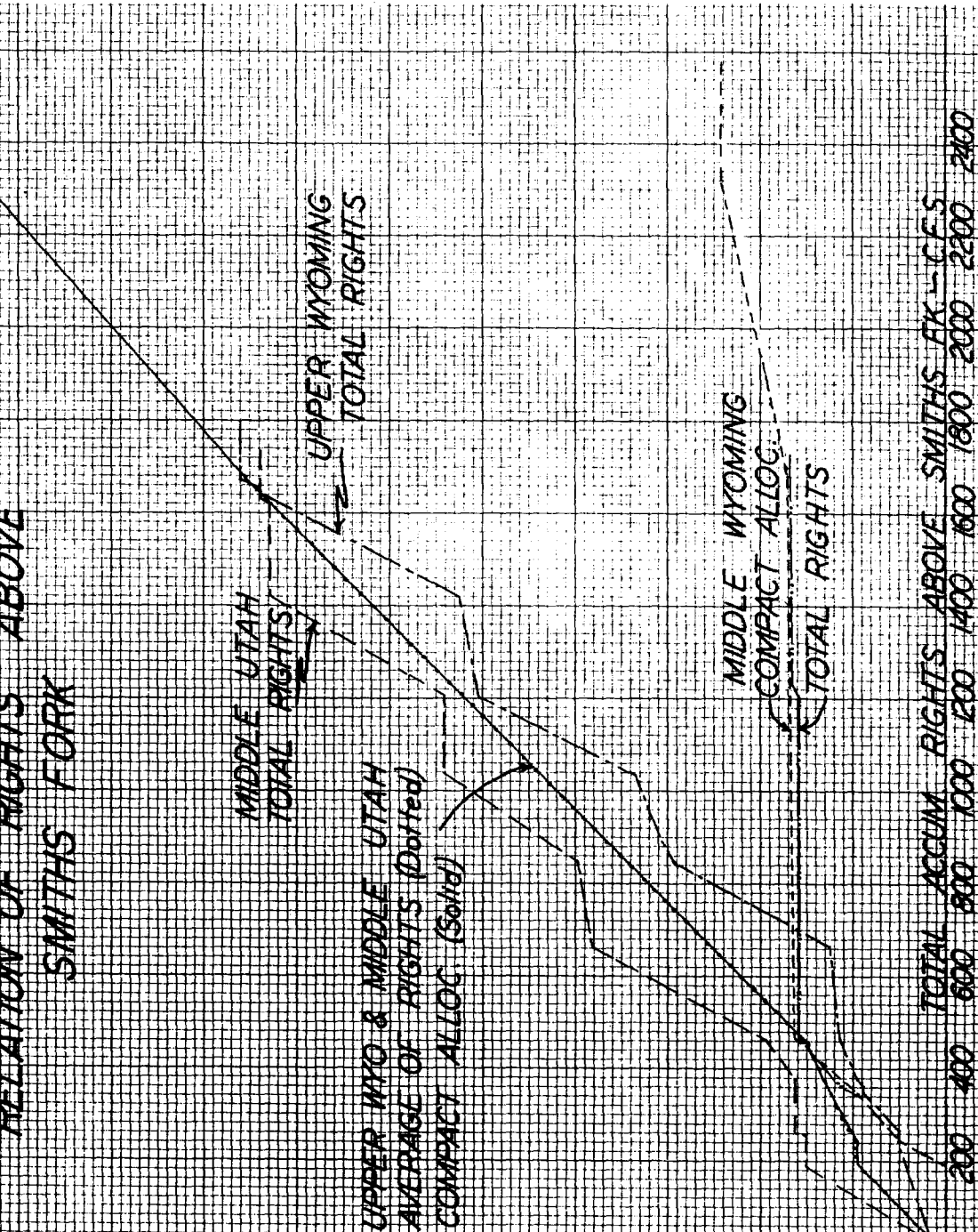
BEAR RIVER ACCUMULATIVE WATER RIGHTS														
Year of Priority	RIVER SECTIONS									RIVER DIVISIONS				
	TOTAL ACCUMULATIVE RIGHTS FOR IRRIGATION									Includ. Outler Power	TOTAL ACCUMULATIVE RIGHTS FOR IRRIGATION			Includ. Outler Power
	Upper Wyoming Section	Middle Utah Section	Middle Wyoming Section	Lower Wyoming Section	Upper Idaho Section	Idaho Rainbow to Gentile Canals	Idaho Below Gentile to Cub Pumps (b)	Lower Utah Section	Lower Utah Section	Includ. Outler Power	Upper Division	Middle Division	Lower Division	Lower Division
(a)	(a)	(a)	(a)	(a)	(b)	(b)	(b)	(b)	(b)	(a)	(a)	(b)	(b)	
1862	6	6	0	0	0	0	0	0	0	12	0	0	0	
63	6	6	0	0	0	0	0	0	0	12	0	0	0	
64	6	6	0	0	0	0	0	0	0	12	0	0	0	
65	6	6	0	0	0	0	0	0	0	12	0	0	0	
66	6	6	0	0	0	0	0	0	0	12	0	0	0	
67	6	6	0	0	0	0	0	0	0	12	0	0	0	
68	6	6	0	0	0	0	0	0	0	12	0	0	0	
69	6	6	0	0	0	0	0	0	0	13	0	0	0	
1970	6	6	0	0	0	0	0	2	2	13	0	2	2	
71	12	6	0	0	0	0	0	2	2	18	0	2	2	
72	16	6	0	0	0	0	0	2	2	22	0	2	2	
73	16	6	0	0	0	0	0	2	2	22	0	2	2	
74	16	38	0	0	0	0	0	2	2	54	0	2	2	
75	41	151	0	0	0	0	0	2	2	192	0	2	2	
76	41	151	0	0	0	0	0	2	2	192	0	2	2	
77	41	151	0	2	295	0	0	2	2	192	297	2	2	
78	50	151	50	8	303	0	0	2	2	250	311	4	4	
79	50	164	53	8	303	2	0	2	2	268	311	4	4	
1880	87	164	96	8	345	2	6	8	8	348	353	16	16	
81	87	164	112	15	345	2	20	8	8	364	360	30	30	
82	95	164	119	15	345	2	25	8	8	378	360	35	35	
83	111	192	159	74	394	2	28	8	8	462	469	38	38	
84	114	192	159	88	429	2	33	8	8	464	517	43	43	
85	123	383	159	112	451	2	33	8	8	665	564	43	43	
86	292	400	159	125	451	2	33	8	8	843	576	43	43	
87	307	425	159	140	451	2	33	8	8	892	591	43	43	
88	336	542	159	149	451	2	33	8	8	1037	601	43	43	
89	358	542	159	154	451	48	33	340	340	1058	606	421	421	
1890	392	542	159	156	451	48	33	344	344	1092	607	425	425	
91	404	542	159	156	451	48	33	344	344	1104	607	425	425	
92	405	542	159	160	451	48	33	344	344	1106	611	425	425	
93	440	542	159	165	451	48	33	344	344	1110	617	425	425	
94	440	542	159	172	451	48	33	344	344	1110	623	425	425	
95	446	542	159	172	451	51	33	344	344	1117	623	428	428	
96	466	542	159	172	451	51	33	344	344	1167	623	428	428	
97	475	542	159	184	455	51	33	344	344	1176	639	628	628	
98	487	542	159	187	455	253	33	344	344	1187	641	630	630	
99	487	542	159	187	455	253	219	344	344	1187	641	816	816	
1900	501	542	159	189	455	253	215	344	344	1202	644	816	816	
01	526	729	166	192	455	528	219	477	344	1422	647	1224	1091	
02	529	729	166	193	455	528	226	477	344	1424	647	1231	1098	
03	532	729	166	200	455	528	226	477	747	1427	663	1231	1501	
04	616	729	166	215	455	540	226	572	842	1511	669	1338	1608	
05	620	729	166	218	455	540	226	572	842	1515	672	1338	1608	
06	621	729	166	227	455	540	226	572	977	1516	682	1338	1743	
07	624	729	166	231	455	540	226	572	977	1519	686	1338	1743	
08	634	729	166	235	455	540	226	572	1112	1530	670	1338	1878	
09	637	729	166	278	455	704	226	572	1112	1532	733	1502	2042	
0910	646	729	166	284	455	758	226	572	1112	1541	739	1556	2096	
11	646	729	166	295	455	3758	226	572	1112	1542	750	1556	5096	
12	648	729	166	297	455	6258	226	572	1612	1544	752	7056	8096	
13	650	729	166	300	455	6258	226	572	1612	1545	754	7056	8096	
14	704	729	166	300	455	6258	326	615	1655	1600	754	7199	8239	
15	727	729	166	301	455	6258	326	617	1657	1623	756	7201	8241	
16	729	729	166	302	455	6258	326	618	1658	1625	757	7202	8242	
17	736	729	166	302	455	6258	326	649	1689	1631	757	7233	8273	
18	736	729	166	302	455	6258	326	658	1698	1631	757	7242	8282	
19	736	738	166	302	455	6258	326	664	1705	1639	757	7248	8289	
1920	739	738	166	302	455	6258	326	678	1718	1642	757	7262	8302	
21	739	738	166	302	455	6258	326	678	1718	1643	757	7262	8302	
22	740	738	166	302	455	6258	326	678	1718	1644	757	7262	8302	
23	740	738	166	302	455	6258	326	678	1718	1644	757	7262	10802	
24	740	738	166	302	455	6258	326	678	1718	1644	757	7262	10802	
25	740	738	166	302	455	6258	326	678	1718	1644	757	7262	10802	
26	742	738	166	302	455	6258	326	678	1718	1645	757	7262	10802	
27	742	738	166	304	455	6258	326	678	1718	1645	758	7262	10802	
28	742	738	166	304	455	6258	326	678	1718	1645	758	7262	10802	
29	742	738	166	304	455	6258	326	678	1718	1645	758	7262	10802	
1930	759	738	169	304	455	6258	326	678	1718	1666	758	7262	10802	
31	761	738	169	304	455	6258	326	678	1718	1668	758	7262	10802	
32	761	738	169	304	455	6258	326	678	1718	1668	758	7262	10802	
33	762	738	169	304	455	6258	326	678	1718	1668	758	7262	10802	
34	762	738	169	304	455	6258	326	678	1718	1668	758	7262	10802	
35	762	738	169	304	455	6255	326	678	1718	1668	758	7262	10802	
36	762	738	169	304	455	6258	326	678	1718	1668	758	7262	10802	
37	762	738	169	305	455	6258	326	678	1718	1668	760	7262	10802	
38	762	738	169	305	455	6258	326	678	1718	1668	760	7262	10802	
39	762	738	169	305	455	6258	326	678	1718	1669	760	7262	10802	

(a) Flow delivery in cubic feet per second on basis of one cubic foot per second for each 50 acres of irrigated lands.  
 (b) Flow delivery in cubic feet per second as decreed.

Plate 3

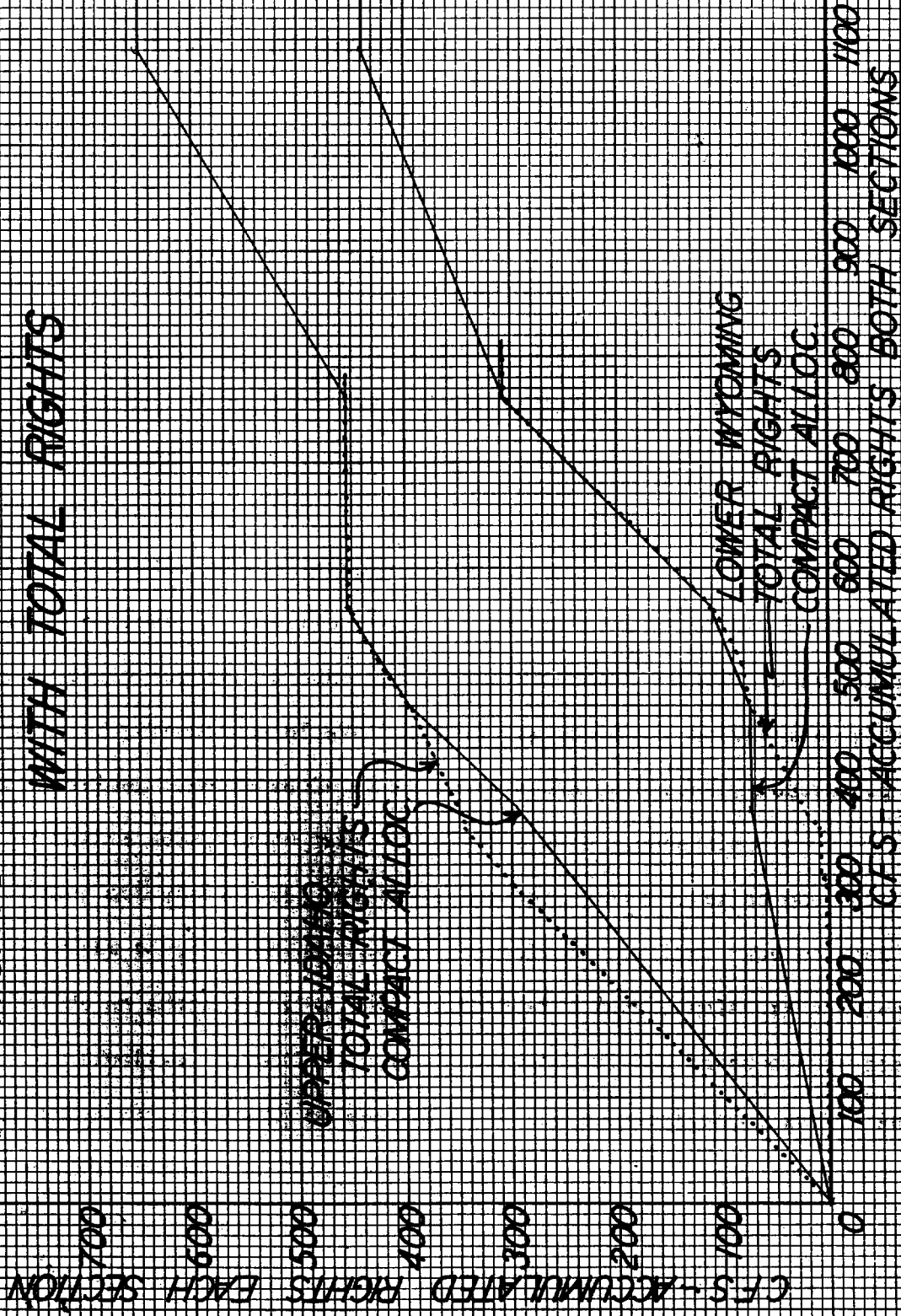
# BEAR RIVER RELATION OF RIGHTS ABOVE SMITHS FORK

SECTION  
CFS - ACCUM. RIGHTS EACH



GAGE HEIGHT IN FEET

BEAR R - RELATION OF PLATE 4  
 RIGHTS IN LOWER WYO. & UPPER IDAHO  
 WITH TOTAL RIGHTS



Wyoming  
the Middle ~~Utah~~ Section 159 second feet, or in other words, all 1899 rights would be filled. Similarly, if 665 second feet were available the Upper Wyoming Section would be entitled to 123 second feet, the Middle Utah Section 383 second feet, and the Middle Wyoming Section 159 second feet, and all 1885 rights would be filled.

#### Ways in Which the Waters of Bear River can be Apportioned Between the States

There are various methods of apportioning water by compact between states, such as mass allocation on an annual or period basis, a schedule of apportionment based on priorities, consumptive use and many others. Each method is applicable to only the particular river problem in question.

The water supplies of Bear River are literally over-appropriated and many rights can only be filled when supply is available. This tends to limit the field of applicable methods of apportionment to those methods which can be applied to momentary or daily supply. A schedule of apportionment related to available supply or a schedule of percentages of available supply would be the most practical method of division. The schedule or percentage can be directly determined by a priority of rights schedule or made relative to such a schedule.

By wiping out state lines and operating the entire river as one unit on a priority of right basis is one method which could be applied. The compact would need to provide an administrative unit clothed with much regulatory and legal powers to be effective. A master schedule of water rights based on the doctrine of appropriation would have to be devised. In the preparation of such a schedule, rights as now on record, could be used if agreeable to all parties. However, here, there may occur some disagreement because the rights on record in the different states are not all on the same plane of equality. To overcome this a schedule of rights would have to be worked out, integrating into it all water rights after adjusting each individual right to a common basis. The difficulties and dangers in formulating such a schedule are hundred-fold and it is doubted if it could be

done except by court action; in other words, a readjudication of all rights in the basin.

Another method is to retain insofar as possible the present political subdivisions and allocate to each a portion of the available supply. The allocations being based on the priority of right principle with the actual delivery and regulation in the political subdivisions effected by state officials duly operating under the laws of their respective states. The compact would need provide some type of basin administrative unit which would regularly inform the state officers of flows available for them and what portion they would have to deliver to the next unit downstream. Certain powers would have to be given the administrative unit to insure the deliveries across state lines.

This method appears more applicable to the Bear River Basin. Present recorded water rights could be used in determining each state section's allocation, taking into account any adjustment necessary to place them on the same plane of equality. This can be accomplished without readjudication or changes in state water right laws.

The determination of the daily allocations can be based on certain key gaging stations which would reflect the supplies available, or on a daily summation of divertible flows. The characteristics of the river as related to supplies and rights previously discussed fits with such a method of apportionment.