4K92 29

PROJECT OPERATIONAL PLAN
FOR THE 1991 ALEUTIAN ISLANDS
GOLDEN (BROWN) KING CRAB SURVEY

By

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Alaska Department of Fish and Game
Division of Commercial Fisheries
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ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES

PROJECT OPERATIONAL PLAN

Title: Aleutian Islands Golden (Brown) King Crab Survey

Yellow Book Project No(s):

Project Leader: Dana Schmidt **PCN:** 11-1202
Biometrician: B. Alan Johnson

Date Submitted: August 14, 1991

Region: Westward

Fishery Units: Statistical Area O (Dutch Harbor) and Statistical Area R (Adak)

Fishery: Dutch Harbor and Adak Brown King Crab Fisheries.

Fishery Management Plan: ADF&G 1990 Commercial Shellfish Regulations, and the Fishery Management Plan for the Commercial King and Tanner Crab Fisheries in the Bering Sea/Aleutian Islands, by the North Pacific Fishery Management Council (Feb. 1989 as amendended by the March 4, 1991 Federal Register 56(42):8985-8986).

File Name:POP

APPROVALS

Level	Signature	Date
Project Leader:		8/14/91
Biometrician:		8/14/91
Research Supervisor:		8/15/91
Regional Supervisor:		8/15/91
Headquarter's Receipt:		

Headquarter's Recommendation:

Further Review: _____ _____

Approval: _____ _____

INTRODUCTION

The Aleutian Islands consist of two management areas for king crabs, Statistical Area O (Dutch Harbor) and Statistical Area R (Adak). Since the developed phase of the Aleutian Island brown king crab (*Lithodes aequispina*) fishery began 10 years ago in the 1981/82 season, 89.4 million pounds of these crabs, having an ex-vessel price of $251 million, have been landed. Approximately 85% of the poundage and value has come from the Adak Management Area and the remaining 15% has come from the Dutch Harbor Management Area.

The brown king crab fishery in the Aleutian Islands is the fourth largest shellfish fishery in Alaska, in both pounds landed and in value, in the last 10 years, with only the Bering Sea red king and Tanner crab fisheries exceeding it (ADF&G 1991). Unlike other areas in Alaska which are surveyed annually for king and Tanner crabs (Bering Sea, Alaska Peninsula, Kodiak, and Cook Inlet) or other areas which are surveyed less often (Southeastern Alaska or Norton Sound) there never has been an ADF&G brown king crab survey in the Aleutians. Ironically five of the six areas mentioned above which are surveyed, currently produce no or lower catches and value of crabs compared to the Aleutian Islands brown king crab fishery.

Observers from both ADF&G and the National Marine Fisheries Service (NMFS) have collected biological data on brown king crabs aboard foreign trawlers or commercial domestic crabbing vessels in the Aleutians. Their findings have been summarized in the following reports: McBride et al. (1982), Otto et al. (1983), Otto (1983), Otto and Cummiskey (1985), Somerton and Otto (1986), three ADF&G unpublished confidential reports, and Beers (1991). In addition NMFS tagged male brown king crabs in the Adak Management Area in 1984 aboard the chartered FV/Starlite. None of the aforementioned trips surveyed the population of brown king crabs within an area in a systematic manner throughout the crabs' depth distribution. Data gathered was at depths that legal males were commercially fished. Yet these crabs are known to segregate to various extents by size, sex and depth (Sloan 1985).

The brown king crab fishery in the Aleutians occurs between the Islands of Four Mountains and the U.S.-Russia Convention Line of 1867, a distance of approximately 720 nmi long by 40 nmi wide. This total area is too large to survey given projected funds to be generate under the Test Fish Program. Red king crabs will be harvested from Bristol Bay in the summer of 1991 under the Test Fish Program to pay for this brown king crab survey in the Aleutians. The goal of this project is to systematically survey the majority of the habitat that brown king crabs occur within a defined area. The area chosen includes adjacent portions of the Dutch Harbor and Adak Management Area, (Statistical Areas O and M respectively). These areas are split at the statistical area boundary line at 171° W longitude. Currently the Adak Management Area is open eight more months to commercial brown crab fishing than is the Dutch Harbor Management Area (ADF&G 1991).

This survey will allow the opportunity to examine, at a minimum, three questions which are important to the management of brown king crabs in this area; 1) is recruitment overfishing occurring? 2) what are the male and female sizes at maturity between the respective management areas and 3) how much do crabs migration across the 171° W longitude statistical area line. The Fishery Management Plan requires that recruitment overfishing must not occur and that fishing mortality not exceed 0.3 annually. By surveying these crabs throughout the majority of the depth range that they occur in, the relative abundance of mature males and legals can be examined. By tagging males, future estimates of fishing mortality can be made. Female and male characteristics will be measured and recorded from which size of maturity sizes can be estimated. From tag recoveries the extent of crab movements between areas can be examined.

OBJECTIVES

1. Determine the size, sex, relative abundance, ovigerity and symbionts of the brown king crabs inhabiting the highest harvest region in the Aleutian Islands (this area includes portions of both the Adak and Dutch Harbor Management Areas). Calculate CPUE of crabs by sex and size groups by depth for each area.

2. Tag male and female brown king crabs. From future tag recoveries of brown king crabs released on this survey, minimum estimate rates of exploitation on male brown king crabs in the areas tagged. Determine growth and migratory movements of male and female crabs, and mature female brooding and molting cycle.

3. Estimate size at 50% maturity (SM50) for male brown king crabs for each of the management areas.

4. Test the hypothesis that the male SM50 is the same for both management areas.

5. Estimate size at 50% maturity (SM50) for female brown king crabs for each of the management areas.

6. Test the hypothesis that the female SM50 is the same for both management areas.

7. Calculate the percentage of male brown king crabs at each millimeter carapace length that have legal widths.

8. Estimate the size of the merus from the second walking leg below which all male brown crabs have sublegal widths. Sample size need not exceed 500.

METHODS

Study Site

In order to identify brown king crab areas to survey in the Aleutians a summary of the statistical areas in the Dutch Harbor and Adak Management Areas which yielded harvests of 45,000 or more crabs in at least one of the last four seasons (1986/87 - 1989/90) were compiled (Appendix A). These 29 areas were ranked according to their four year mean and placed on a statistical chart of the Aleutians. The region chosen to conduct a survey in lies between 169°00′ W - 173°20′ W longitude and 51°50′ N - 53°20′ N latitude. This region includes five of the seven highest commercial brown king crab production areas in the Aleutians.

Sampling Design & Collection Methods

The 100′ FV/Western Viking was the vessel chartered to conduct the survey from. Mr. Jan Jastad, owner-operated of the vessel, will be onboard the vessel during the survey which is scheduled to run for 30 days, beginning August 21. The charter will begin and end from Dutch Harbor. The charter may be cut short if insufficient numbers of red king crabs are not caught on the Bristol Bay survey, as part of the Test Fish Program to pay for this survey.

Stations were selected using a systematic spatial sampling design. Stations were laid out NOAA charts 16480 and 16500 using a 5 nmi grid pattern. Stations within the study site were selected when they occurred over depths from 75 to 500 fathoms as indicated on the charts. Those depths cover the majority of the brown king crabs habitat. Each station encompasses an area of approximately 25 nmi^2. Conical crab pots, covered with tarred nylon web with a stretch mesh of 9 cm will be fished using longline gear. Five stations per day will be fished with 15 pots per station. Pots will be spaced 100 fm apart making, each station 1.38 nmi long. The skipper will be required to write down on the pilot house log: the location, sequential pot number, depth, time, etc. of each string, and when it was set and pulled (see attached Pilot House Log - Pot Surveys). This task will require an ADF&G crew person to record when pots are being set. Pots will receive a two day soak prior to retrieval, except after the midcharter break. Each pot will be baited with 4 liters of chopped herring and one Pacific cod for hanging bait.

There will be four ADF&G personnel aboard (biologists and/or technicians) whose primary duties are to identify, measure, record the catch. For each pot retrieved which contains marine life, the species will be identified and assigned a species code and recorded on the Crab Research Data Form. Additional data that can be recorded on this form include: sex, size, alive or dead, and for crabs; legal or sublegal, shell age, egg (color, development, condition, clutch size), chela height, merus length, symbionts, and tag numbers. Detailed information on species identification, how

and where to take measurements, how to tag, etc. can be found in the Crab Research Survey Manual.

Five thousand numbered "spaghetti" tags will be available for tagging male and female brown king crabs. Tags will be applied through the isthmus muscle, and fastened with an overhand knot, (Alaska Dept. Fisheries 1954). A goal of 4,000 tags will be applied to males and 1,000 to females. All tagged crabs will be released at the same station as caught. Current estimates of the catch of brown king crabs (CPUE) from commercially fished conical pots on 2-day soaks in the survey area is four to five crabs/pot (Jastad and Beers, pers. comm.). On another vessel fishing further west using 1-2 day soaks on conical pots averaged 7 CPUE (Blau 1987). The above CPUEs were obtained from fishing primarily between 100-250 fm. Our survey pots will be fishing down to 500 fm, with CPUE rates expecting to decrease with depth. The percentage of male and female brown king crabs captured per pot is nearly equal (Blau 1987; Beers 1991). Assuming 1,800 pots will be lifted during the survey (24 fishing days x 75 pot lifts/day) multiplied by a estimated CPUE of 4 crabs = 7,200 crabs caught; = 3,600 each of males and females. Therefore all male crabs $\geq$ 100 mm carapace length (CL) will be tagged. This will include sublegal males, one to two years away from legal size, based on growth data (Koeneman 1985; and Otto pers. comm.). For females $\geq$ 90 mm CL, every fourth female will be tagged. With 111 mm CL being the estimated size of maturity (Somerton and Otto 1986) then this size range to tag will include immature females with one or more years time before reaching maturity.

A mini-experiment will be performed to examine the effects of tagging and the "elevator ride" of crabs caught at deep depths. Ten females and 10 males caught between 400-500 fm will be placed in one or two pots, when strings are next set. Five crabs of each sex will be tagged. The opening in the top of the pot will be covered to prevent the crabs' escape. The crabs will be added to the end of a string of gear in 400-500 fm, and pulled at the end of two days.

Rules for Subsampling

There may be times when the volume of brown king crabs captured may slow down the operation considerably, especially when high catches occur at more than one station per day. Crabs will not be subsampled in individual pots. To insure that the daily flow of the charter continues without drastically changing average soak times or decreasing the number of stations fished per day the following options can be performed: 1) decrease specific measurements taken/pot (e.g. do not identify or measure fish or invertebrates (except brown king crabs); on male brown king crabs do not measure carapace width outside the spines, chela height or merus length; 2) sample 2 out of 3 pots for the whole string so that 10 are sampled out of 15 pots. "Pot Not Sampled" will be written in the comments section on the Crab Data Form used on deck and on the Pilot House Log form, adjacent to the pots not sampled. 3) when setting gear for the following day set all 5 stations with

only 10 pots each. For those pots not sampled, the number of brown king crabs will be counted, sexed, and recorded on the Crab Data Form.

If near the end of the survey there are more stations to fish than possible, the density of the stations will remain the same, but stations that have depths that have proven to have the lowest CPUEs will be eliminated, eg. the shallowest or the deepest.

Electronic Data Entry - Whenever possible data that would normally be recorded on the Crab Data Form will instead be entered directly onto a AST laptop II computer which has a Cannon 10-E printer attached. Two headphones will link the on-deck measurers and taggers directly to the person entering the data onto the computer. ADF&G personnel will man and operate all computer equipment. If any problems occur, rendering the computer data entry system inoperable, then the on deck Crab Data Form will be used to record all biological data.

LOGISTICS

The ADF&G crew will leave Anchorage on August 20, 1991 and fly to Dutch Harbor around noon. They will then do some shopping for needed items, fill out time sheets in advance and then be taken to the Western Viking. The vessel is scheduled to depart Dutch Harbor on August 21. The vessel cruises at 9 knots and it is about 270 nmi to the western most portion of the survey area in Seguam Pass, so once the vessel begins it's charter, it will take 30 hours to run to the starting stations. Stations will be set and picked on a two day soak rotation starting in the western portion of the survey area and moving to the eastern boundary of the survey area.

Date	Pick 5 Stations	Set 5
Stations		
8-23		+
8-24		+
8-25	those set 8-23	+
8-26	" " 8-24	+
8-27	" " 8-25	+
8-28	" " 8-26	+
8-29	" " 8-27	+
8-30	" " 8-28	+
8-31	" " 8-29	+
9-1	" " 8-30	+

-Continued-

Date	Pick 5 Stations	Set 5
Stations		
9-2	" " 8-31	+
9-3	" " 9-1	+
9-4	" " 9-2	+
9-5	" " 9-3	+
9-6	" " 9-4	+
9-7	" " 9-5	+
9-8	" " 9-6	+
9-9	" " 9-7	+
9-10	" " 9-8	+
9-11	" " 9-9	+
9-12	" " 9-10	+
9-13	" " 9-11	+
9-14	" " 9-12	+
9-15	" " 9-13	+
9-16	" " 9-14	+
9-17	" " 9-15	+
9-18	" " 9-16 & 17	No
9-19	18 + hr. run to Dutch Harbor from eastern end of survey area; end of charter.	
9-20	All ADF&G vessel crew take first available Mark Air flight back to Anchorage; Fish Tech IIIs will be off payroll at that time. Blau returns to Kodiak on first available flight on ERA.	

The greatest number of days that gear could be pulled would be 26 days (times 5 stations/day = 130 stations maximum). **Note:** it is likely that the number of stations that will be fished is less than 130 for the following reasons: 1) strong tides and currents can literally pull surface buoys down for days not allowing retrieval; 2) weather that is too difficult or unsafe for the biological crew may occur; and 3) if not enough red king crabs are caught in Bristol Bay to pay for this survey under the Test Fish Program, then this survey can be stopped at any time.

A daily radio schedule will be maintained between the F/V Western Viking and the ADF&G office in Dutch Harbor.

Methods Analysis

1. Brown king crabs will be split into the following groups: females (juvenile and adults) and males (prerecruit, legals; including subclasses of each of these two groups to be determined after the survey. Catch per pot (CPUE) statistics for each of the preceding groups will be calculated for each station fished and summarized into one of the following depth

categories (fathoms): 75-99, 100-199, 200-299, 300-399, and 400-500. Overall CPUE and depth summaries will also be calculated for the Dutch Harbor and Adak management areas.

2. Tag recoveries of brown king crabs released on this charter will begin during the 1991/92 season from ADF&G dockside samplers and from observers on catcher-processors. Exploitation rates on legal males will be calculated for each management area after their respective commercial seasons have ended. Growth and migration of male and females will be calculated. Ovigerity data will be examined to help define the adult female brooding, eggless, and intermolt periods.

3. Estimate the male SM50 by describing the relationship between the chela height and carapace length for the two management areas using the statistical methods outlined in Jewett et al. 1985.

4. The SM50 for both areas will be considered the same if the carapace lengths at SM50 are within 3 mm of each other.

5. Female size at 50% maturity for each management area will be estimated by using a logistic curve as in Blau, 1990. All females examined for percent clutch will be included in the analysis. Adult females will be defined as those: 1) having external eggs, 2) barren females with empty egg cases attached to their pleopodal setae or 3) barren females $\geq$ 50 SM. Juvenile females all those that are not defined as adults.

6. The SM50 for females from both areas will be considered the same if the carapace lengths at SM50 are within 3 mm of each other.

7. Carapace length and carapace width (outside the spines) measurements from male crabs over the size range collected will be taken. The percentage of males at each millimeter carapace length that are $\geq$ legal width of 152.4 mm (6") will be calculated.

8. The merus length of the second walking leg (after Somerton 1986) and the carapace width, outside the spines, will be measured to the nearest millimeter on male brown king crabs over the size range collected. A regression line will be fit to the data from which the size of the merus will be estimated below which all male brown crabs in the Dutch Harbor and Adak Management Areas will have sublegal widths.

SCHEDULES

DATE(s)	Personnel (optional)	Activity
6/91-2/92	S. Forrest Blau (FBII) -	Charter planning, survey crewleader, report writing
8/91-9/91	Gil Marick (FTIII) -	Survey crew man
" "	Kathy Holbart (FTIII) -	" crew woman
" "	Tamela Anderson (FTIII) -	" " "

REPORTS

DATE	Author(s)	Report
1/91	S. Forrest Blau (+ others ?)	Draft TFR
2/91	" "	Final TFR to Juneau

LITERATURE CITED

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Somerton, D.A. 1986. At-sea processing and its implications on optimal yield per recruit of Alaskan king and Tanner crabs. In G.S. Jamieson and N. Bourne (ed.) North Pacific workshop on stock assessment and management of invertebrates. Can. Spec. Publ. Fish. Aquat. Sci. 92:245-251.

Appendix A. Numbers of brown king crabs landed from the 1986/87 to 1989/90 seasons in the Adak and Dutch Harbor Management Areas from statistical areas having >45,000 crabs landed in them in one or more of these seasons.

Stat. Areas	Fishing Seasons '89/90	'88/89	'87/88	'86/87	Means	Rank
Dutch Harbor Mgt. Area						
695301	87618	52957	84066	21302	61486	12
705200	77996	79784	186576	127335	117923	7
705232	107703	137997	148494	80956	118788	6
705300	41765	36588	76706	24798	44964	16
Adak Mgt. Area						
715202	364940	312003	218708	285414	295266	1
715231	157094	234918	22546	184415	149743	2
715232	52087	13700	24872	85380	44010	17
725201	196123	13700	108504	160969	119824	5
725230	28846	25656	46936	59679	40279	18
765132	46326	25656	0	7573	19889	28
775131	1386	7320	82537	60662	37976	20
785131	5668	62429	71361	84402	55965	13
795132	68125	31857	74734	77254	62993	11
805101	7721	9591	67065	6396	22693	26
805103	51395	60917	21810	70509	51158	14
805132	144556	80741	30877	272486	132165	3
805201	31620	56773	46015	154756	72291	10
815131	18705	5431	15719	48058	21978	27
825201	55476	57779	1046	53687	41997	18
825203	0	0	14559	45658	15054	29
835130	20226	13268	6166	50517	22544	25
835200	82899	142451	98468	160916	121184	4
845130	42080	26502	51133	29412	37282	21
845201	2522	54489	27488	30306	28701	23
845202	112362	141810	82293	117362	113457	8
855200	115622	18571	75631	94014	75960	9
865203	34339	10826	6290	67113	29642	22
875232	54305	17537	46180	68379	46600	15
885300	7900	6465	80746	15645	27689	24
Stat Total	2017405	1737716	1817526	2545353	2029500	
Fishery	2499366	2551301	2535464	3218331	2701116	
Percent	81	68	72	79	75	

Four Year Total
StatTotal 8118000
Fishery 10804462
Percent 75

5/21/91

PROJECT TITLE: Bering Sea Crab Test Fishing
FISHERY UNIT: Bering Sea/Aleutians Crab
COMPONENT: Commercial Fish BPS# 3800
LOCATION: Kodiak
SUBCOMPONENT: Test Fish Funds
LEGISLATIVE DISTRICTS : 27

PROJECT NUMBER: TF-960
LEDGER: 74119751
PRINTORD: No order
REGION: 4
PRIORITY: 1.00

PROGRAM ELEMENT: Test Fish Survey
FISHERIES AFFECTED: Bering Sea Crab

USER GROUPS AFFECTED: Commercial

SPECIES AFFECTED: King Crab and Tanner Crab

PROJECT DESCRIPTION

Funding from this project will support the State's direct expenses for conducting shellfish tagging projects in the Bristol Bay and Aleutian Islands areas. The Bristol Bay red king crab harvest was valued recently in excess of $100 million. Error in estimating natural mortality rates and population abundances can jointly provide major errors in development of Guideline harvest levels. The Adak and Dutch Harbor Brown crab stocks are valued at over $30 million annually. These stocks have not been surveyed and the current harvest rate may surpass the Federal overfishing definition. Without survey data, the fishery may be closed for conservation purposes, because of stock abundance uncertainty.

PROJECT OBJECTIVES

Aleutian red and brown king crab populations are assessed to provide information for development of guideline harvest levels. Data will be collected on all crab captured during the surveys. Long term tag recovery data should provide information on natural mortality rates to be used in estimating harvest rates designed to meet conservation and economic objectives established by the BOF.

BUDGET MANAGER: 1857 - Leslie J. Watson - Marine Fisheries Biologist

BUDGET DETAIL: CODE/LINE ITEM	PRIOR YEAR ALLOCATIONS FY89	FY90	FY91	SUMMARY	
100 PERSONAL SERV	0.0	0.0	0.0	98.5	13.0 PFT 85.4 Other
200 TRAVEL	0.0	0.0	0.0	25.4	
300 CONTRACTUAL	116.0	0.0	28.9	393.7	
400 COMMODITIES	0.0	0.0	0.0	21.0	
500 EQUIPMENT	0.0	0.0	0.0	125.5	
700 GRANTS	***	***		0.0	
PROJECT TOTALS:	0.0	0.0	28.9	664.1	
FEDERAL RECEIPTS	0.0	0.0	0.0	0.0	
GENERAL FUND	0.0	0.0	0.0	-0.1	
INTERAGENCY RECPTS	***	***	0.0	0.0	
PROGRAM RECEIPTS	116.0	0.0	28.9	664.2	
GENERAL FUND MATCH	***	***	0.0	0.0	
STAFF MONTHS	0.0	0.0	0.0	13.2	

Appendix B. FY92 ALLOCATION YELLOWBOOK PAGE 2 PROJECT DESCRIPTION

PROJECT TITLE: Bering Sea Crab Test Fishing
UNIT: Bering Sea/Aleutians Crab
COMPONENT: Commercial Fish BPS# 3800

PROJECT NUMBER: TF-960
LEDGER CODE: 74119751
PRINT ORDER: No order
REGION: 4

PERSONAL SERVICES DATA

PCN	TITLE & NAME	Range R	S	LOC	92		Premium Pay Hours MM	OT	SEA	HAZ	SWING	GRAVE	TOTAL COST
1006	FB II - Blau, S Forrest	P	F	CAA	16K	16K	0.0	0.	425.	0.	0.	0.	4709.73
1117	FB I - Byersdorfer, Su	A	S	CAA	14B	14B	6.0	0.	1100.	0.	0.	0.	34135.45
1202	FB IV - Schmidt, Dana	P	F	CAA	20F	20F	0.0	0.	330.	0.	0.	0.	4504.28
1351	FB II - Beers, Dean	A	S	CAA	16A	16A	0.0	0.	825.	0.	0.	0.	7164.19
1825	FT III - Phillips, Kim	P	S	CAA	11D	11D	0.5	0.	0.	0.	0.	0.	1889.86
1843	FT III - Rudge, Kimber	P	S	CAA	11E	11E	0.5	0.	0.	0.	0.	0.	1964.77
1857	FB III - Watson, Lesli	P	F	CAA	18D	18E	0.0	0.	330.	0.	0.	0.	3819.67
N932	FT III - Vacant,	A	N	BKB	11A	11A	1.3	0.	725.	0.	0.	0.	8459.09
N933	FT III - Vacant,	A	N	BKB	11A	11A	1.3	0.	725.	0.	0.	0.	8459.09
N934	FT III - Vacant,	A	N	BKB	11A	11A	1.8	0.	1000.	0.	0.	0.	11688.28
N935	FT III - Vacant,	A	N	BKB	11A	11A	1.8	0.	1000.	0.	0.	0.	11688.28
							13.2						98482.69

PROJECT LINE ITEM DETAIL

LINE#	DESCRIPTION	AMOUNT	COMMENT
72240	Field Travel	21.2	Travel
72500	Per Diem	4.3	Per Diem expenses.
73100	Professional Services	0.6	Photo processing.
73400	Transportation	0.6	Excess baggage
73500	Advertising, Printing & Bind	0.3	Printing
73860	Rental Machinery & Equipment	2.0	Truck Rental
73860	Rental Machinery & Equipment	390.0	Test Fish Charters.
73900	Other Expenditures & Services	0.2	Freight
74220	Office & Library Supplies	13.5	Tag rewards
74220	Office & Library Supplies	0.9	Office Supplies
74480	Household & Institutional	1.0	Groceries
74480	Household & Institutional	1.5	Gloves, hardware, (etc).
74600	Other Operating Supplies	3.6	Survival Suits
74650	Repair & Maintenance Supply	0.5	Misc Electrical
75870	Laboratory & Scientific Eqip	62.4	PIT Tags
75870	Laboratory & Scientific Eqip	0.3	Floy Tags
75870	Laboratory & Scientific Eqip	53.0	Auto Detectors
75870	Laboratory & Scientific Eqip	9.8	Misc Tagging Equipment
	TOTAL LINES 200 - 700	565.6	DATE PRINTED 07/18/1991
	TOTAL PROJECT COST	664.1	

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