



TARANAKI FISH & GAME COUNCIL

AGENDA PAPERS

COUNCIL MEETING

**SATURDAY
10 FEBRUARY 2018**

Statutory managers of freshwater sports fish, game birds and their habitats

Taranaki Region

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AGENDA

SATURDAY 10TH FEBRUARY 2018

TO BE HELD AT
RUAPEHU FISH AND GAME CLUB ROOMS
SEDDON STREET, RAETIHI

COMMENCING AT 10:00AM

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TARANAKI FISH & GAME COUNCIL

MINUTES OF THE MEETING OF THE TARANAKI FISH & GAME COUNCIL, HELD AT THE OFFICE OF TARANAKI FISH AND GAME, 124 RIDGWAY STREET, WHANGANUI ON 2 DECEMBER 2017, COMMENCING AT 10:00AM.

The Chairman, Paul Blewman, called the meeting to order at 10:12 am.
He welcomed councillors, Fish and Game staff and visitor to this meeting

1. PRESENT

Councillors Paul Blewman, Alan Flynn, Gerard Karalus, Romon Sargeson, Steve Hugo, Cory Potroz, David Potroz, Chris Donald, Chris Bright, John Nancarrow and Craig McEwen.

IN ATTENDANCE

Manager Glenn Maclean, Senior Field Officer Allen Stancliff, Secretary Jilli Steedman and Graeme Mackenzie.

2. APOLOGIES

Apologies were received from Terry Russell and Blu Cumberworth.
MOVED NANCARROW / D POTROZ
THAT THE APOLOGIES RECEIVED BE SUSTAINED
CARRIED

3. CONFLICT OF INTEREST

There were none that hadn't already been advised at previous meetings.

4. MINUTES OF THE PREVIOUS MEETING 14th OCTOBER 2017

MOVED D POTROZ / DONALD
THAT THE MINUTES OF THE PREVIOUS MEETING HELD ON 14TH OCTOBER 2017 IN STRATFORD, BE CONFIRMED AS A TRUE AND CORRECT RECORD.
CARRIED.

5. MATTERS ARISING

There were none.

6. AGENDA MANAGEMENT

The Chairman noted he would be unable to attend the next meeting in Raetihi and tendered his apologies.
Councillor Donald tendered his apologies for the March meeting.

The Manager noted that he had negotiated a lease agreement which the Chairman had signed for the new office accommodation in New Plymouth, and that exceptional funding bid for this has been approved.

7. HEALTH AND SAFETY

MOVED NANCARROW / HUGO

THAT THE MANAGERS HEALTH AND SAFETY REPORT, BE RECEIVED
CARRIED

8. DRAFT 2018 GAME GAZETTE

Councillors discussed in depth the recommendation regarding the use of magazine extensions and also the wider need to actively promote appropriate behaviour by Taranaki hunters.

The manager advised Councillors on the reason for the 3rd resolution. Councillor D Potroz thought this should apply to the whole of the game season not just the special summer season, and it was noted that a 200m rather than 300m exclusion would be consistent with the regulation regarding the use of lead shot near waterways.

Councillors expressed agreement with the 4th resolution noting their distaste for wasted game.

MOVED BRIGHT / HUGO

THAT TARANAKI FISH AND GAME COUNCIL AGREE THAT;

1. THE SAME BAG AND SEASON CONDITIONS AS FOR THE 2016 AND 2017 GAME SEASONS BE RETAINED AS LAID OUT IN THE DRAFT GAME GAZETTE NOTICE ON PAGE 28 AND 29 OF THIS AGENDA.
2. THE USE OF A MAGAZINE EXTENSIONS BE PROHIBITED.
3. NO PERSON SHALL BE PERMITTED TO HUNT WITHIN 200M OF AN URBAN SEWAGE OXIDATION POND.
4. IT SHALL BE AN OFFENCE TO WILLFULLY LEAVE ON THE HUNTING GROUND ANY GAMEBIRD(S) SHOT OR PARTS OF ANY GAMEBIRDS SHOT.

5 FOR

5 AGAINST

1 ABSTAIN

Consistent with the Standing Orders the Chairman exercised a casting vote acknowledging he was following the accepted protocol to vote for the status quo.

MOTION LOST

MOVED C POTROZ/NANCARROW

THAT TARANAKI FISH AND GAME COUNCIL AGREE THAT;

1. THE SAME BAG AND SEASON CONDITIONS AS FOR THE 2016 AND 2017 GAME SEASONS BE RETAINED AS LAID OUT IN THE DRAFT GAME GAZETTE NOTICE ON PAGE 28 AND 29 OF THIS AGENDA.
2. NO PERSON SHALL BE PERMITTED TO HUNT WITHIN 200M OF AN URBAN SEWAGE OXIDATION POND.
3. IT SHALL BE AN OFFENCE TO WILLFULLY LEAVE ON THE HUNTING GROUND ANY GAMEBIRD(S) SHOT OR PARTS OF ANY GAMEBIRDS SHOT.

CARRIED
UNANIMOUSLY

9. LICENCE SALES REPORT

MOVED KARALUS / C POTROZ

THAT THE 2017/2018 LICENCE SALES REPORT TO 21 NOVEMBER 2017, BE RECEIVED
CARRIED

10. 2018 MEETING DATES

This agenda item has been carried forward to this meeting as the confirmed NZ Council meeting dates for 2018 have now been received. Councillors thought that the November meeting should be held in Hawera and the AGM in New Plymouth.

MOVED NANCARROW/MCEWEN

THAT THE SCHEDULE OF MEETING DATES AND LOCATIONS DECIDED BY COUNCIL FOR 2018, BE ADOPTED

MEETING DATES AND VENUES FOR 2018

<i>Proposed Taranaki Fish & Game Council Meeting Dates</i>		<i>Unconfirmed New Zealand Fish & Game Council meeting dates</i>
Date	Location	Date
10 February 2018	Raetihi	16-18 March 2018
24 March 2018	Whanganui	18-19 May 2018
9 June 2018	Waitara	20 June 2018 (Tele Conf)
18 August 2018	Opunake	20-23 July 2018
3 November 2018	Hawera	28-29 September 2018
8 December 2018	New Plymouth	23-25 November 2018

CARRIED

The Chairman asked that the next agenda item – Predator Control, be scheduled after the lunch break.

12. CHAIRMAN'S REPORT

The Chairman advised Council that the lease for the New Plymouth office has been signed.

He noted his contact with the auditor who complemented the Council on its 5 year plan and strategic approach.

He attended the presentation of an environmental award for Allen Stancliff, and noted the huge amount of respect Allen has from his peers.

MOVED BLEWMAN / KARALUS

THAT THE CHAIRMAN'S VERBAL REPORT BE RECEIVED

CARRIED

13. NATIONAL COUNCILLORS REPORT

National Council appointee Alan Flynn advised Councillors of the last meeting of the National Council he attended.

- The National Council Performance Report to 31 August 2017, was presented.
- The Minister of Conservation, Eugenie Sage, attended the meeting.
- A redrafted submission for the guides licence will be presented at a future meeting.
- Mallard releases were discussed and the agenda paper is to be forwarded to regional Fish & Game Councils for comment
- Martin Taylor attended his first meeting as CEO.

MOVED FLYNN / KARALUS

THAT NATIONAL COUNCIL APPOINTEE, ALAN FLYNN'S VERBAL REPORT BE RECEIVED

CARRIED

Break for lunch 12:30

Reconvened 1:30

11. PREDATOR OCCURRENCE TRIAL

The manager spoke to his paper, and described the methodology used during this trial which identified cats as a major predator. Councillor Flynn noted that a legal opinion of what constitutes a feral cat was being sought. Types of traps and rules applying to live captures were noted.

The manager noted his interaction with land owners who have undertaken riparian and wetland projects and who are seeking confirmation that they are doing it right. He noted that a Whanganui property owner that has spent a considerable amount on wetland enhancement is keen to pursue a predator control programme in association with the Council. This could be an opportunity to test the practicalities and refine just what is needed to make for an effective predator control programme for wetland species.

MOVED SARGESON / C POTROZ

THAT THE MANAGER'S PAPER ON PREDATOR CONTROL, BE RECEIVED

CARRIED

14. WORK PLAN TO 17 NOVEMBER 2017 AND BUDGET PROGRESS REPORT TO 31 OCTOBER 2017

The funding application to TET for the Stratford kids' trout fishing promotion has been successful.

MOVED MCEWEN / D POTROZ

THAT THE BUDGET REPORT TO 31 OCTOBER 2017 AND PROJECT PROGRESS REPORT TO 17 NOVEMBER 2017, BE RECEIVED

CARRIED

15. FINANCIAL REPORT

MOVED D POTROZ / DONALD

THAT PAYMENTS OF \$91,115.86 AND INCOME OF \$38,893.06 AND \$11,500 (MRP) FOR SEPTEMBER AND OCTOBER 2017 AS SHOWN ON PAGES 56 & 57 OF THE AGENDA, BE APPROVED

CARRIED.

16. CORRESPONDENCE

MOVED D POTROZ / DONALD

THAT INWARDS AND OUTWARDS CORRESPONDENCE SCHEDULES TO 21ST NOVEMBER 2017, AS SHOWN ON PAGES 60 & 61 OF THE AGENDA, BE RECEIVED.

CARRIED

17. GENERAL BUSINESS

Gerard noted his visit to Lake Namunamu and the positive view the owner has of Taranaki Fish & Game. He also thought that a lake near Hawera would be a good for releases for kids fishing opportunities and he will explore this with the landowner.

Craig McEwen noted his involvement in the trout releases in the Patea River and that these went well.

Chris Donald thanked councillors who assisted with the kids fishing day at Lake Rotomanu, noting how successful the day was with over 100 trout caught.

MOVED FLYNN / DONALD

THAT THE PUBLIC AND STAFF BE EXCLUDED FROM THE MEETING

CARRIED

18. NEXT MEETING

The next meeting will be held on 10 February 2017 in Raetihi.

19. CLOSURE

There being no further business the Chairman closed the meeting at 2:50pm.

APPROVED AS A TRUE AND CORRECT RECORD

CHAIRMAN _____

DATE _____

TARANAKI FISH & GAME COUNCIL

The Chairman
Taranaki Fish & Game Council

AGENDA MANAGEMENT

Council should do the following things;

- Review progress with items on the Action List, these items derived from past Council meetings
- Review the Annual Program for Meeting Agendas, and decide if any items should be added/ moved or deleted from this
- Review the Current Agenda and decide on the order of items, the timing requirements for items, any items to be deferred, or any new business to be tabled.

No resolutions should be necessary here, unless to resolve debate on a future course of action. The Minutes will record all issues that Council agrees, and these will be reflected in future Action Lists, Annual Programs, and Agendas as may be appropriate.

Glenn Maclean
Regional Manager
31 January 2018

TARANAKI FISH & GAME COUNCIL

ACTION LIST ARISING FROM COUNCIL DECISIONS

Subject	Responsible	Target Date	Item Update – Actions Required
Reinstatement of sign at Lake Mangamahoe/ erection of fishing platforms	Manager	June 2017	Awaiting initial design to then run past an engineer for review
Fishing access – Normanby Loop	Field Officer	May 2017	Ongoing.
Formalize wards for next election	Manager	July 2018	Manager to publically advertise change
Invite to Conservation Board chair	Manager	February 2018	Awaiting appointment of new board
Send draft Game Gazette	Manager	December 2017	Sent 13/12/2017
Agree lease for New Plymouth Office	Manager & Chair	November 2017	Completed and Draft Exceptional Funding bid successful
Include Profit & Loss & Balance Sheet in agenda	Secretary	February 2018	Completed

TARANAKI FISH & GAME COUNCIL

ANNUAL MEETING AGENDA PROGRAM

Meeting	Board	Operational	Statutory	Strategic/Policy
10 February 2018 Raetihi	All Board Items	All Operational Items, to be received	Confirm Game Season Regulations.	Review 5 Year Strategic Plan
24 March 2018 Whanganui	All Board Items	All Operational Items, to be received	Consider Draft 2018/2019 Annual Operational Work Plan & Budget. <ul style="list-style-type: none"> • Fish Season Regs. • Licence fee recommendation 	<ul style="list-style-type: none"> • Nominations for Bruce McKenzie Memorial Award
9 June 2018 Waitara	All Board Items.	All Operational Items, to be Received	<ul style="list-style-type: none"> • Adopt 2018 / 2019 Annual Plan 	<ul style="list-style-type: none"> • Receive nominations for Bruce McKenzie Memorial Award • 2018 Game Season Report
18 August 2018 Opunake	All Board Items.	All Operational Items, to be Received		
3 November 2018 Stratford	All Board Items.	All Operational Items, to be Received	<ul style="list-style-type: none"> • End of Year Project Reports 	<ul style="list-style-type: none"> • 2019 meeting dates • First meeting of new Council
8 December 2018 Whanganui Ordinary meeting and AGM	All Board Items.	All Operational Items, to be Received	<ul style="list-style-type: none"> • 2019 Game Gazette Notice 	<ul style="list-style-type: none"> •

2016/17 – 2020/21 Strategic Plan
Presented & Adopted 11th February 2017

Work Area	Key Result	2016/17	2017/18	2018/19	2019/20	2020/21
Advocacy	Signage	Lake Mangamahoe information signs	Replace/ erect new signs on rivers and lakes around the region consistent with the priorities identified			
		Identify sign locations and priorities and prescribe replacement schedule				
Advocacy	New or updated angling and hunting pamphlets	Coastal lakes with emphasis on how to catch perch		Whanganui River		
		Update Waimarino pamphlet including Manganuioteao and Mangawhero rivers				
		Update Waingongoro pamphlet	Update Taranaki Ringplain pamphlet			
Advocacy	Effective use of the Media	Introduction to pheasant hunting in Taranaki Region	Introduction to pheasant hunting in Taranaki Region	Introduction to duck hunting opportunities in the Taranaki Region		
		Develop new pages when new platform available and then regularly update	Develop new pages when new platform available	Review media strategy		
		Develop facebook page				

	Children's fishing days	Trial to rear fish for Stratford fishing day			
	Increase participation	Develop displays that promote local fishing and hunting	Develop mentoring schemes for hunters and anglers	Explore options for discounted licences for beginning hunters	
	Support for F&G				
Compliance	Compliance strategy				Review Strategy
	Honorary Rangers	Implement outcomes of compliance strategy review			
Resource Management Act	Taranaki Freshwater Plan	Actively engage in process as opportunities arise			
	Our long-term approach		Review strategic approach (to include priorities and time commitments)		
Administration	Simplify operational outputs and coding	Implement any outcomes of National Council financial review			
	New Plymouth office	Consider implications and options when tenant retires		Implement preferred option	
	Whanganui office	Consider options when lease up (1 Nov 2017)			
	Administrative support	Review computing requirements including file storage/ sharing			

Sports fish monitoring and management	Obtain baseline information for key streams	Manganuioteao River					
	Investigate value of stocking specific streams and lakes	Waingongo, Kapuni Kaipokonui Stream and tributaries	Waiwhakaiho system				
	Investigate opportunities to restore fisheries	Stony River	Timaru Stream				
	Improve angler access	Investigate provision of increased angling access around Lake Mangamahoe					
	Use of angler surveys and diaries	Review opportunities to monitor specific rivers in light of NAS results and to include satisfaction					
	Review Management Plan					Review and complete new Management Plan (expired 8 August 2021)	
	Long-term operation	Review requirements and options. Will be influenced by needs studies above, children's fishing day review and also by future NP office requirements		Implement decisions			
	Hatchery	Exotic disease response plan					

Gamebird monitoring and investigations	Mallard Duck monitoring	Investigate movement of ducks between high and low country and implications for any monitoring programme		Implement long-term monitoring plan	
		Implement trial monitoring protocol and refine as required			
Pukeko monitoring	Habitat enhancement	Review options to promote and encourage predator control	Promote practical outcomes out of the Mallard Research Project	Establish environmental award	Review option of a summer season
		Explore option for wider Nukumarū wildlife area			
New opportunities		Predator trapping trial/s to enhance game populations			
		Resolve permits to rear, release and banding Review criteria/ policy to rear and release upland game	Locate and publicise quality gamebird recipes especially for paradise duck		
Hunter aspirations		Options to enhance access to lakes Wiritoa, Kohata and Kaitoke	Investigate feasibility of Red Legged Partridge		
			Survey of aspirations of upland game bird hunters	Survey of aspirations of waterfowl hunters	

Review: February 2018 Council Meeting

TARANAKI FISH AND GAME COUNCIL

The Chairman

Taranaki Fish and Game Council

DRAFT 2017/18 -2021/22 STRATEGIC PLAN

Background

The 5 year Strategic Plan is a multi-year planning document which identifies and schedules agreed work programmes taking into account Council priorities and that the work load needs to be achievable. The agreed Plan guides development of the annual Operational Plan.

The Plan is a 'living document' which is reviewed and amended annually to take into account current Council priorities, any changed circumstances or new projects that have been identified.

Attached is a draft plan for 2017/18 to 2021/22 for consideration by Council. A number of changes and amendments are suggested which are detailed below.

Suggested Changes

Signage: Lake Mangamahoe signs and identification of sign locations were scheduled to be complete last season. The lake signs are on hold until the first angling platform is finished (this work is progressing) and the identification of sign locations is continuing in the current season. Therefore the draft plan is updated to reflect that this work is ongoing.

Hunting and angling pamphlets: In this day and age pamphlets are becoming less and less useful as most people now turn to the internet in the first instance to find information. This draft plan is therefore suggesting we change our emphasis to primarily producing our information for the web. There are several advantages in this – it is easier and quicker to produce the information, cheaper and it can also be readily updated. However it is suggested that once a number of these pages are in place then a generic pamphlet be produced that directs people to the relevant places to look. As part of this the information on perch fishing is pushed back to next season, noting that a number of other information pages are all scheduled to be completed in the current season.

Use of media: Linked to this discussion it is suggested that keeping the web pages current and up to date should be an ongoing strategic objective.

Increase participation: National Office has indicated they are now looking at developing new updated displays which may well address our needs. In any case it is suggested that development of local displays is not a priority compared to resolving the website and this objective be removed.

So far our attempts to develop a mentoring programme have been singularly unsuccessful, which is also consistent with recent research we have seen. However what has been more successful in several of our neighbouring regions are information/ instruction days and it is suggested that we widen this objective to explore the use of these.

Manage hunter behaviour: In recent discussions Council has identified the need for a long-term strategy around what we might want to achieve in terms of modifying hunter behaviour and how this should be approached.

Compliance strategy: There is a view which I share that at some point in the future it may not be possible to generally use honorary rangers due to health and safety requirements. Therefore it is suggested that an objective is included which allows Council to pro-actively explore other options if and when these might be available.

Resource Management Act: Review of our strategic approach is pushed out several years noting that this cannot occur until the Taranaki Freshwater Plan, which will shape what is required, is completed.

Administration: Implementation of any National Policy is pushed out a year reflecting that this process is still ongoing.

Now that Council has agreed to retain the Whanganui Office it is proposed to increase the signage on the outside of the building and to update the reception to better reflect Fish & Game and what we do.

Review of our computing requirements was scheduled to be completed last season but is still ongoing. In part this is due to needing to finalise our office accommodation, however the file sharing system promoted to Fish & Game and adopted by some regions has proved not to be suitable for us with our remote office.

Trout stocking: With the completion of the Waingongoro, Kapuni and Kaupokonui stocking trial this season it is recommended that a formal review and plan for stocking around the region is completed next season.

Restoring fisheries: The Stony River continues to be unstable which precludes any attempt to enhance it past the annual releases of two year old fish. Therefore it is suggested that the focus move to the Timaru stream and the Stony be reassessed in 2019/20.

Improve angler access: We now know there is opportunity for us to provide up to two angling platforms at Lake Mangamahoe and it is suggested that this objective is changed to reflect the erection of these platforms.

Following an approach by Councillor Karalus there appears opportunity to develop a put and take fishery in the irrigation pond just outside of Hawera which if feasible we expect would be highly valued.

Hatchery: A number of different strands are coming together which will collectively define the objectives for the hatchery operation. However a key one is the development of a stocking strategy in 2018/19. Hence it is suggested that this objective be pushed out one year to allow for completion of this strategy first.

A draft Exotic Disease Response Plan was developed last season however this is not yet signed off so this objective is extended to the current season.

Mallard duck monitoring: This clarifies that the current trial is to develop a protocol for the Waimarino region. On the basis of results so far it is suggested that a different protocol may need to be developed to monitor the Whanganui population and that this should be the next step.

Habitat enhancement: A review of the options for predator control is essentially complete, however it highlights that developing effective predator control around wetlands is very much work in progress. Hence it is suggested that this is replaced with a long-term objective around seeking to continue to advance our knowledge and effectiveness of programmes. Related to this is the current objective to actively trial some approaches.

In recent years we have had a lot of success working with private landowners to develop high quality wetlands and it is suggested that continuing this work should be reflected as a long-term strategic objective.

New opportunities: A need to resolve issuing permits to rear and release (and disturb) gamebirds continues to be a key objective that is somewhat out of our hands. However this has recently gained greater impetus with the discussion around captive reared mallards (CRMs). Until this is resolved (and a national policy developed for CRMs) then it is not possible to progress a regional policy on rearing and releasing gamebirds. To this end this objective is extended for two more years.

Enhancing hunting access to Lakes Wiritoa and Kohata is precluded by the ever encroaching development. Similarly the owners of Lake Kaitoke are very unlikely to be amenable to any change of designation here, therefore it is suggested that this objective is removed.

Similarly Council agreed in developing the 2017/18 operational Plan not to pursue the objective examining the feasibility of Red Legged Partridge.

RECOMMENDATIONS

That Taranaki Fish & Game Council adopt this 5 Year Strategic Plan for 2017/18 to 2021/22 with the changes as included.

Glenn Maclean

Regional Manager

23 January 2018

2017/18 – 2021/22 DRAFT Strategic Plan

Presented 10th February 2018

Work Area	Key Result	2016/17	2017/18	2018/19	2019/20	2020/21	2020/22	
Advocacy	Signage	Lake Mangamahoe information signs	Replace/ erect new signs on rivers and lakes around the region consistent with the priorities identified					
		Identify sign locations and priorities and prescribe replacement schedule						
	New or updated angling and hunting pamphlets and/or web pages	Coastal lakes with emphasis on how to catch perch			Whanganui River.			
		Update Waimarino pamphlet information including Manganioteao and Mangawhero rivers				Produce pamphlet with guidance re where to find detailed information		
		Update Waingongoro pamphlet information			Update Taranaki Ringplain pamphlet information			
		Introduction to pheasant hunting in Taranaki Region			Introduction to duck hunting opportunities in the Taranaki Region			
	Effective use of the Media	Develop new pages when new platform available and then regularly update						
					Review media strategy			

	Develop facebook page					
Children's fishing days	Trial to rear fish for Stratford fishing day					
Increase participation	Develop displays that promote local fishing and hunting		Explore options for discounted licences for beginning hunters			
	Develop mentoring schemes for hunters and anglers including public instruction/ information days					
Manage hunter behaviour			Develop long-term strategy to achieve appropriate hunter behaviour	Implement strategy		
Compliance strategy				Review Compliance Strategy		
			Consider other options to undertake compliance if and when these become available			
Honorary Rangers	Implement outcomes of compliance strategy review					
Taranaki Freshwater Plan	Actively engage in process as opportunities arise					
Resource Management Act	Our long-term approach				Review strategic approach (to include priorities and time commitments)	
Administration	Simplify operational outputs and coding		Implement any outcomes of National Council financial review			

	New Plymouth office	Consider implications and options when tenant retires	Implement preferred option						
	Whanganui office	Consider options when lease up (1 Nov 2017)	Update signage and office interior						
	Administrative support	Review computing requirements including file storage/ sharing							
Sports fish monitoring and management	Obtain baseline information for key streams	Manganuioteao River	Waiwhakaiho system						
	Investigate value of stocking specific streams and lakes	Waingongoro, Kapuni & Kaipokonui Stream and tributaries	Review and refine stocking plan for region						
	Investigate opportunities to restore fisheries	Stony River		Stony River					
	Improve angler access	Investigate provision of increased angling access around Lake Mangamahoe	Provide for increased angling access around Lake Mangamahoe through provision of two angling platforms						
	Use of angler	Review opportunities to monitor	Develop fishery in Hawera irrigation pond						

	surveys and diaries	specific rivers in light of NAS results and to include satisfaction			
	Review Management Plan			Review and complete new Management Plan (expired 8 August 2021)	
Hatchery	Long-term operation	Review requirements and options. Will be influenced by stocking studies above, children's fishing day review and also by future NP office requirements		Implement decisions	
		Exotic disease response plan			
Gamebird monitoring and investigations	Mallard Duck monitoring	Investigate movement of ducks between high and low country and implications for any monitoring programme			
		Implement trial monitoring protocol for Waimarino and refine as required	Implement long-term trial monitoring protocol for Whanganui		
	Pukeko monitoring				Review option of a summer season
	Habitat enhancement	Review options to promote and encourage predator control	Promote practical outcomes out of the Mallard Research Project	Establish environmental award	
			Promote and develop quality wetland and upland game habitats in association with private landowners and other agencies and including by promoting the GBHT and H&H funds		
			Keep up to date with current predator control techniques and operations and actively seek to implement effective programmes as appropriate		
			Explore option for wider Nukumarū wildlife area		
New opportunities		Predator trapping trial/s to enhance game populations			
		Resolve permits to rear, release and banding		Locate and publicise quality gamebird recipes especially for paradise duck	
		Review criteria/ policy to rear and release upland game			
	Options to	Investigate			

		enhance access to lakes Wirihoā, Kehata and Kaitoke	feasibility of Red Legged Partridge				
	Hunter aspirations		Survey of aspirations of upland game bird hunters	Survey of aspirations of waterfowl hunters			

Review: February 2019 Council Meeting

TARANAKI FISH AND GAME COUNCIL

The Chairman
Taranaki Fish and Game Council

HEALTH AND SAFETY – February 2018

Background

As part of its commitment to Health and Safety and providing a safe workplace the Council requires a report at each meeting detailing the implementation and adherence to the Health and Safety policy and manual including;

1. any new issues or hazards that have arisen and how these have been addressed
2. progress with any ongoing issues
3. outcomes of audits and reviews required in the Health and Safety manual
4. any near misses or injuries and including investigation outcomes and recommendations

Update

1. New issues or hazards	
High daily temperatures	Dress appropriately, wear sunscreen and hat when outdoors, keep hydrated, plan work to avoid being outside over hottest parts of the day. Make use of office air conditioning
Thunderstorms and lightning	Be aware that driving conditions and river flows may change – avoid being in the field when the risk of late afternoon storms is high. Avoid high points and large trees during lightning storms, also activities that may act as a conductor
3. Ongoing issues	
Safe storage	Allen has moved to his new office. Need to complete mezzanine floor and ensure equipment and files are safely stored.
CERT safety training required for 3 Taranaki F&G honorary rangers	Refresher training day scheduled for 3 March 2018 in Rotorua. One ranger is unavailable

<p>Sharp edge of shelf opposite photocopier at Whanganui Office</p> <p>Trustpower required specific Hazard Control Plan to undertake Patea releases</p>	<p>Jilli has discussed moving shelf onto adjacent wall with landlord.</p> <p>Received the following from Trustpower <i>"Firstly I just wanted to reiterate what a fantastic job Fish and Game has done for the Patea restocking job. The Health and Safety process we went through a couple of iterations but ultimately resulted in a very robust document. Your subsequent documentation and supporting report reflects that Fish and Game take the matter very seriously. Trustpower's HSE Manager commends Fish and Game and will be using this project as an example of collaboration at her next presentation to the Board. Thank you."</i></p>
<p>4. Audits , reviews and meetings</p>	
<p>HSE included as agenda item for staff meeting</p> <p>Annual review of Health and Safety Manual</p> <p>F&G self-audit</p> <p>Staff check use of PPE gear by others in the field</p>	<p>Staff meeting held 17 November 2017</p> <p>Completed September 2017</p> <p>Completed July 2017</p> <p>Staff undertaking Manganuioteao survey all wore PPE gear consistent with the requirements detailed in the HCP for this activity</p>
<p>5. Near misses and injuries</p>	
<p>Nil</p>	

Glenn Maclean
 Manager
 February 2018

TARANAKI FISH AND GAME COUNCIL

The Chairman
Taranaki Fish and Game Council

2018 GAMEBIRD TREND COUNT REPORT

This report presents the January 2018 trend count information for paradise shelduck and black swan and makes recommendations on the provisions of the 2018 *Game Gazette Notice* in respect of these two species. The Council considered information and made initial recommendations regarding the 2018 *Game Gazette Notice* at its meeting on 2nd December 2017, with those provisions relating to the above two species to be re-confirmed at the February 2018 meeting.

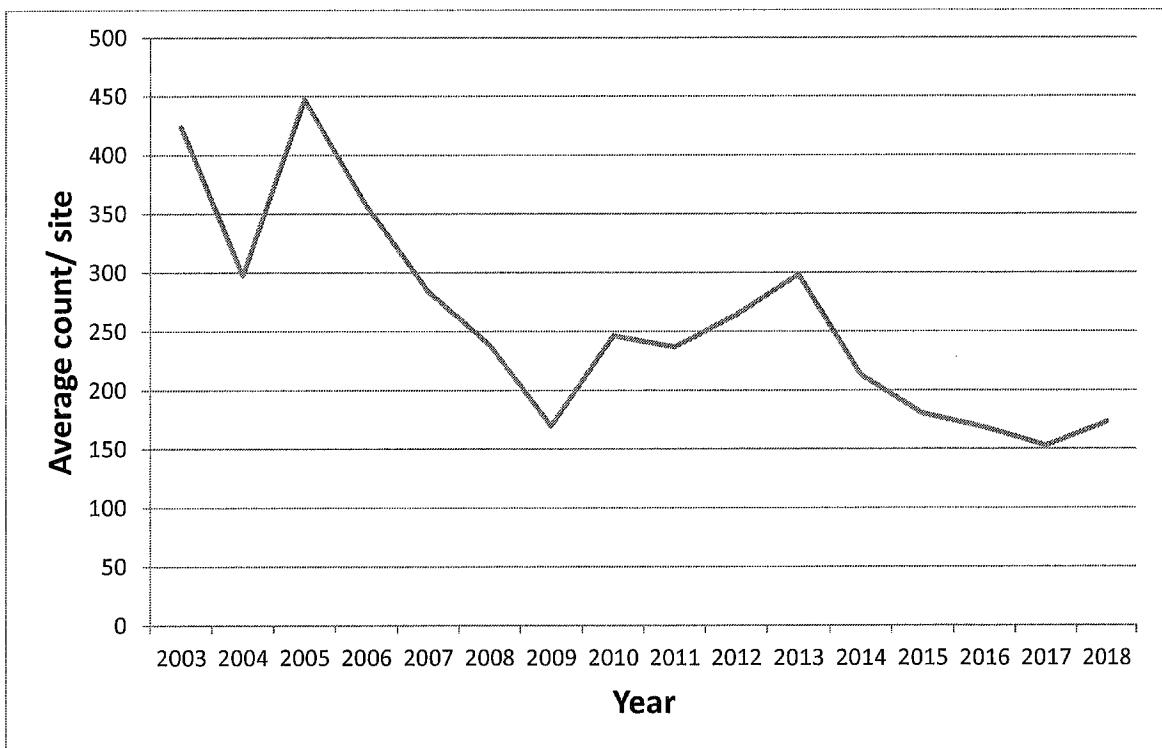
In addition there is also a change suggested regarding the bag limit for 'all other gamebird species' as listed in schedule 2, to address a recent discussion.

PARADISE SHELDUCK

WAIMARINO (AREA A)

A total of 23 Waimarino moult sites and/or properties were visited in January 2018 to count paradise shelduck. The total count of 3,975 paradise shelduck was higher than the 3,518 birds estimated in 2017 but less than the 4,035 birds in 2016. Figure 1 which plots the average number of birds counted per site over the period 2003 to 2018 (to take into account that the total number of sites counted has varied over time) confirms that the Waimarino population remains at the "low end" of its historical range of abundance.

Figure 1 Average number of paradise shelduck counted per site in Area A 2003 to 2018



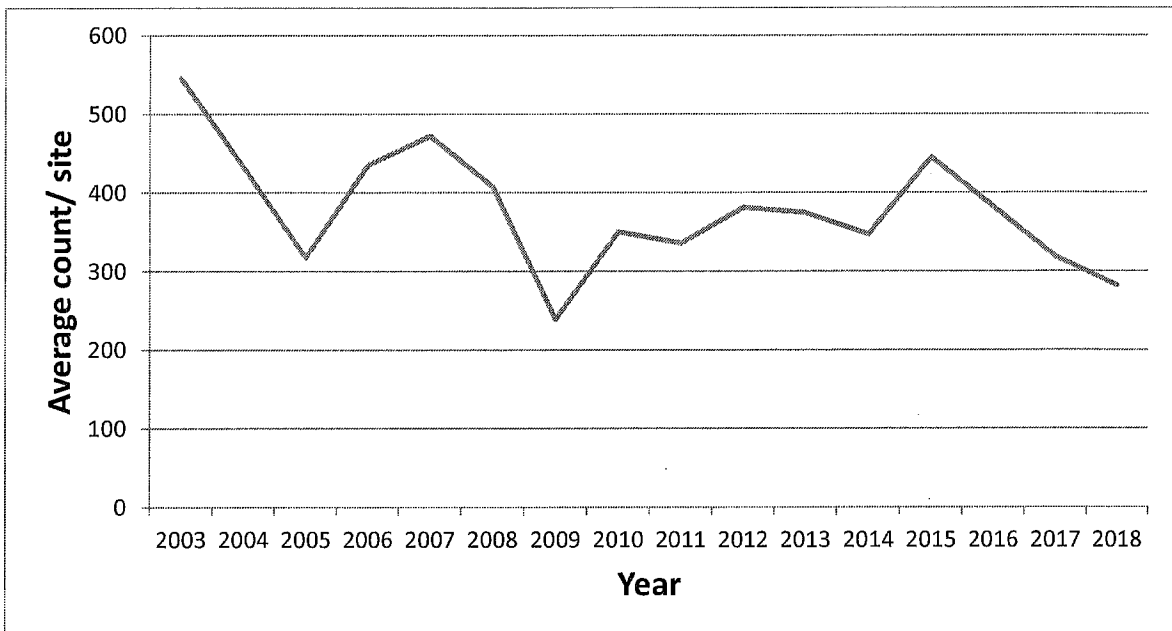
Landowners generally appear comfortable with recent levels of impacts from the paradise duck population in contrast to earlier years, and to this end the population in recent years is likely to be at an appropriate level. However the population does appear to be struggling to rebound and there are also some indications that it may have not been a particularly good breeding season last spring.

While no changes to the 10-bird limit and 8-week season for the Waimarino area (that has been in place since 2010) are recommended for 2018 we nevertheless note this uncertainty looking forward. For this reason it is recommended that no special season for paradise shelduck be gazetted in the Waimarino in March 2019.

WHANGANUI (AREA B)

Paradise shelduck were counted at 14 Whanganui coastal and hill country moult sites in January 2018. The total 2018 estimate of 3,945 paradise shelduck was slightly lower than the estimated 4,137 paradise in 2017 which in turn was the lowest count since 2009. It is not known whether the extremely dry November and December period that coastal Whanganui experienced will have influenced where paradise shelduck chose to moult, nevertheless Figure 2 suggests that the Whanganui paradise population is at the “low end” of its historical range of abundance.

Figure 2 Average number of paradise shelduck counted per site in Area B 2003 to 2018



The Council has gazetted a 10-bird limit for an 8-week main season for paradise shelduck for many years now in Whanganui. As for the Waimarino, it is recommended that the Council continue to set the same regulations in 2018 but also note that if numbers don't respond in the near future that we may need to consider greater restrictions.

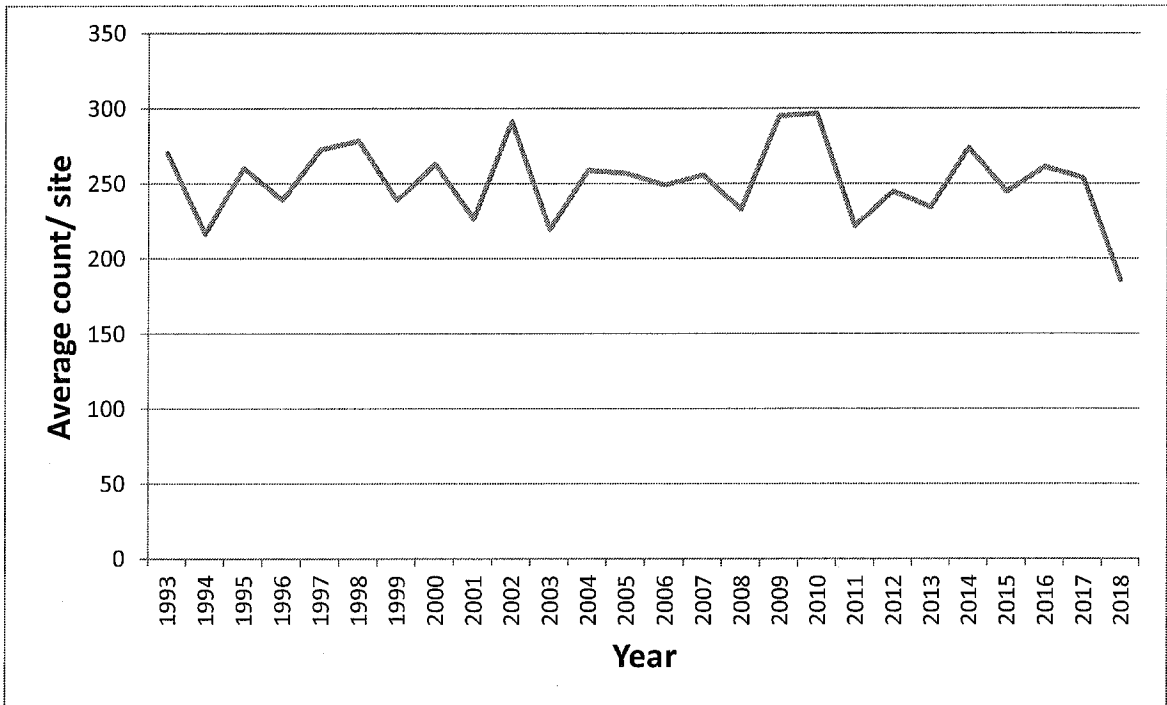
In 2016 the Council decided not to hold a March special season for paradise shelduck in Area B, due to a lack of interest from hunters. On the basis of these counts it is recommended that no special season be gazetted in Whanganui for 2019, with any issues dealt with on a site by site basis through permits to disturb.

TARANAKI PROVINCE (AREA C)

Counts of paradise shelduck were undertaken at 49 sites in Game Management Area C in mid to late January 2018 including sites in the Taranaki eastern hill country, ringplain and coastal areas as far north as Mohakatino and as far south as Waverley.

The 2018 estimated total count of 9096 paradise shelduck was well down on the 11,635 birds counted in 2017 which in turn was similar to the 2016 and 2015 counts. Figure 3 highlights that on a bird numbers per site basis that the 2018 average (186 birds) was only 73% of the long-term average of 251 birds per site.

Figure 3 Average number of paradise shelduck counted per site in Area C 1993 to 2018



We put considerable resources into these monitoring counts on the basis that we believe they are a robust monitoring method. As such we need to assume the significant drop this year reflects a real change. This is also consistent with our observations that for whatever reason, paradise shelduck do not appear to have experienced particularly good breeding success over the last two very wet spring periods. While the moult counts concentrate on flightless adult birds (birds 3 years or older that have bred and are subsequently moulting) young birds that are still hanging around their parents are also included. However it is not known what proportion of one and two year old immature birds are included in the overall total count.

The indications are that the adult population has declined significantly on that of recent years, and furthermore that recent breeding and recruitment of young birds may not have been particularly successful. It is therefore recommended that the Council take a proactive approach and amend its December 2017 decision to set a 15-bird limit for opening weekend 2018 in Area C, reducing this back to a 10 bird limit consistent with that for the rest of the 8-week season and also the rest of the region.

In 2017 this regulation change would have impacted on 9 out of the 117 hunters interviewed (7.7%) regarding their opening weekend success in Area C, and saved an estimated 13% of the paradise shelduck harvest or approximately 320 birds.

A 2-weekend special season is already gazetted for paradise shelduck in Area C for 24 – 25 February and 3 - 4 March 2018 inclusive, with a daily bag limit of 10. This special season has value in allowing hunters the opportunity to disperse birds from areas where they are causing damage to crops or pasture. However in light of the recommendation to reduce the opening weekend daily bag limit it is also recommended to reduce this special season in 2019 to a single weekend. In practice this may not reduce the summer harvest significantly as the change may simply focus all the hunting effort on this single weekend. However it does reinforce the message that the resource is coming under pressure and the need to implement more conservative bag limits. Therefore it is recommended that a single weekend special season on the 2-3 March 2019 be confirmed in Area C for 2019.

BLACK SWAN

WANGANUI – WAVERLEY COASTAL STRIP

A total of 256 black swan were counted during a ground survey of 11 dune lakes in the Whanganui to Waverley coastal strip in January 2018. This was less than the count in 2017 (380 birds), and below the long term (28-year) average of 320 birds. However the major difference between the last two counts was at Lake Kaitoke where a gas gun was operating on the far bank this year. It is not known what difference this has made.

WAIMARINO - WANGANUI HILL COUNTRY

A total of 36 black swan were counted at 12 sites visited in the Waimarino, which was higher than the previous three years and slightly above the longer term (12-year) average of 33 birds.

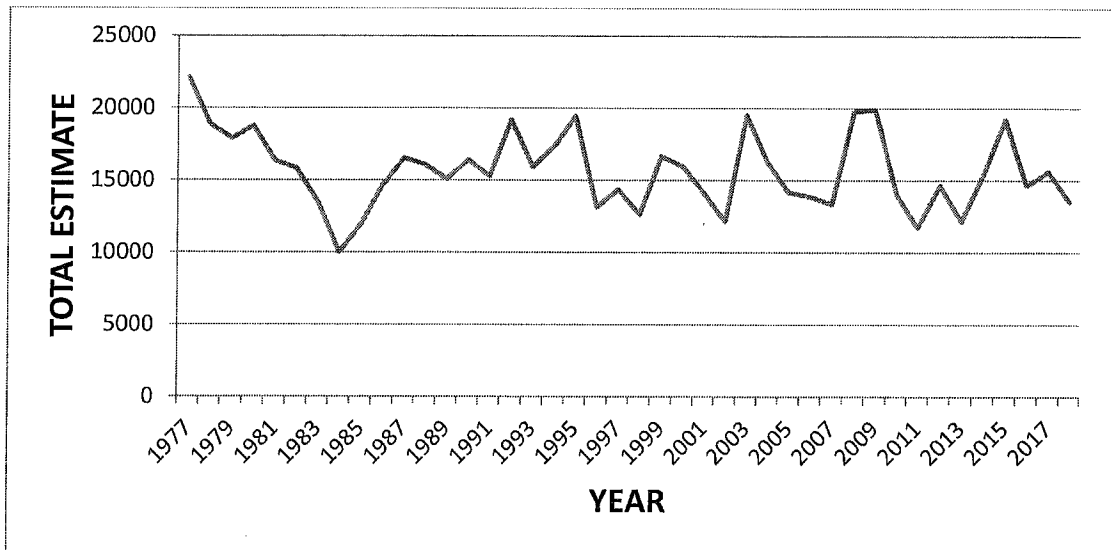
NORTH AND SOUTH TARANAKI

Black swan counts in the north and south Taranaki areas remained above the long-term average in January 2018, but were down slightly on the preceding six years, with a total of 366 swan counted at the 29 sites visited (214 swan in north Taranaki and 152 in south Taranaki).

CENTRAL NEW ZEALAND

The January 2018 count for Lake Wairarapa, Wellington west, Whanganui coastal and Farewell Spit came to 13,537 swan. However the count for the rest of Nelson/Marlborough was not available when the agenda went to print. As it stands this count is less than last year's estimate of 15,622 swan for the whole region including Nelson/ Marlborough, and also less than the long-term average of 15,717 birds (Figure 4). However when the additional count for Nelson/ Marlborough is included the total is expected to be in this vicinity or higher.

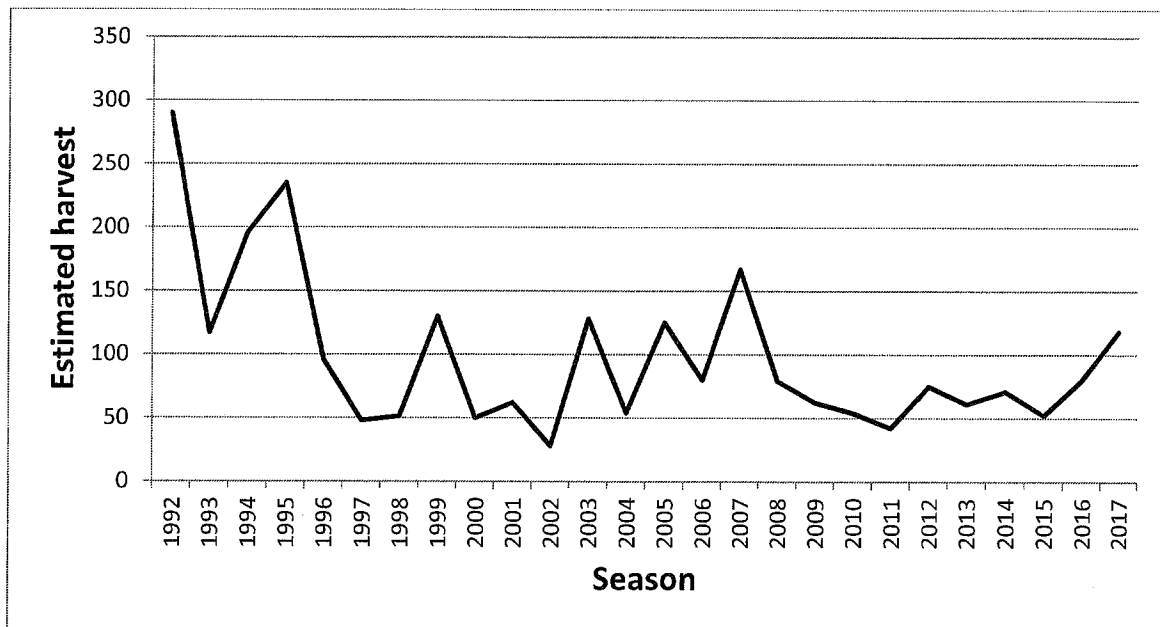
FIGURE 4 Central NZ trend counts for black swan 1977 to 2018.



* 2018 count incomplete

In 2003 and 2004 the Council allowed black swan to be harvested throughout the region, rather than only in the Whanganui - Opunake coastal strip, but retained the ban on harvest in the first week of the season. Since 2005, the Council has allowed swan to be harvested throughout the region from opening weekend on and in 2016 the daily bag limit was raised from 1 bird to 2. To date these changes have had little impact on harvest levels, which have mostly remained at less than 100 birds per season though this did rise to an estimated 118 birds in 2017.

Figure 5 Estimated harvest of black swan in the Taranaki Region 1992 to 2017



In the light of the count and harvest information, it is recommended that the Council continue to set an 8-week hunting season for black swan throughout the region, with a daily bag limit of two swan per hunter.

DAILY BAG LIMIT FOR ALL OTHER GAMEBIRD SPECIES

In the table in Schedule 2 listing season duration and daily bag limits for each gamebird species there is a final category for those game species (as listed in the Wildlife Act 1953) that are not otherwise covered in the table above. Previously the season for these species has been set the same as for other upland game, with a one bird daily bag limit applicable across the region.

It has recently been raised by some visiting hunters that this allows them to shoot one hen pheasant because there are no prescribed conditions for hen pheasant. I would strongly argue that because conditions are prescribed for cock pheasant then the species is already addressed, however it is not a debate I really want to waste time on. In the bigger picture I would suggest a species is either strong enough to sustain some hunting and therefore has its own set of appropriate regulations, or it isn't and therefore should not be hunted at all. For example as it stands this provision also allows hunters to shoot a single brown quail. However previously brown quail were listed in the schedule with a zero bag limit to reflect their precarious population status, something which has not changed. To this end we recommend removing the season conditions for 'all other game species' which means any gamebird species not specifically mentioned in the schedule cannot be hunted.

In summary it is recommended that the following changes are made to the season conditions agreed by Council at its December 2017 meeting. Note that the deletion of point 6 – Pond Feeding does not represent a change rather that this provision is now covered by a general provision in Schedule 1 and so is unnecessary.

TARANAKI FISH AND GAME REGION¹

1 Game That May be Hunted or Killed—Duration of 2018/2019 Season

Species	Season Duration (dates inclusive)	Daily Bag Limit	Hunting Area
Grey/mallard duck	5 May to 1 Jul 2018	10	All areas
NZ shoveler duck	5 May to 4 Jun 2018	2	All areas
Paradise shelduck	5 May to 1 Jul 2018	10	Areas A&B All areas
	5 May to 6 May 2018	15	Area C
	7 May to 1 Jul 2018	10	Area C
	2 and 3 March 2019	10	Area C
	9 and 10 March 2019	10	Area C
Black swan	5 May to 1 Jul 2018	2	All areas
Pukeko	5 May to 26 Aug 2018	5	Areas A&B
	5 May to 26 Aug 2018	10	Areas C
California quail	5 May to 26 Aug 2018	5	All areas
Cock pheasant	5 May to 26 Aug 2018	2	All areas
All other game bird species ²	5 May to 25 Aug 2018	1	All areas

2 Definition of Areas

2.1 Area A: That area within the following boundary commencing at Waiaruhe Road; then by that road, Owhakura Road, Whangaehu Valley Road and Fields Track to

¹Reference to Description: *Gazette*, No. 83, of 22 May 1990, at page 1861

²Wildlife declared game as listed in Schedule 1 of the Wildlife Act 1953

Kakatahi; then by straight lines to Pipiriki and Tawhata; then by Tawhata Road to the boundary; then by the generally eastern boundary of the region to Waiaruhe Road.

2.2 Area B: That area within the following boundary commencing at Waiaruhe Road; then by that road, Owhakura Road, Whangaehu Valley Road and Fields Track to Kakatahi; then by straight lines to Pipiriki and Makakaho Junction down the eastern bank of the Waitotara River to the sea; then by the sea coast and generally eastern boundary of the region to Waiaruhe Road.

2.3 Area C: The balance of the region contained by the westerly boundaries of Area A and B and the sea coast between the Mokau River and Waitotara River mouths.

3 Shooting Hours

6.30am to 6.15pm.

4 Decoy Limit

No limit.

5 Special Conditions

1. Special Paradise Shelduck Season

Area C only: 2 March and 3 March ~~and 9 March and 10 March~~ 2019, 6.30am to 8.00pm. All hunters, including land occupiers, must hold a valid Taranaki Special Season Hunting Permit to participate. Permits are available from the Taranaki Fish and Game office and selected licence agents.

2. No person shall hunt, as specified, within 200m of any urban sewage oxidation pond.

3. No person may wilfully leave on the hunting ground any game bird(s) shot or parts of any game birds shot.

6 Pond feeding

~~Pond feeding is permitted.~~

RECOMMENDATION:

That the recommended conditions for the 2018/2019 game season as listed above be confirmed.

Glenn Maclean and Allen Stancliff

1st February 2018

TARANAKI FISH AND GAME COUNCIL

The Chairman

Taranaki Fish and Game Council

RELEASE OF CAPTIVE REARED MALLARDS

Background

The attached papers from New Zealand F&G Council detail a review of the practice and possible impacts of releasing captive reared mallards. Also included is a submission from Jeff Niblett who is a director of New Zealand Gamebirds Ltd.

In terms of determining its position and subsequently drafting National Policy the New Zealand Council seeks guidance regarding 5 questions as listed on page 7 of the review.

The paper by Dr Williams provides a comprehensive review of the possible biological benefits and costs. He suggests that while such releases are not effective for enhancing the wild population nor do they appear to have any negative biological or ecological impacts. The debate is therefore more about ethical, monitoring and legal considerations.

In my limited experience to date of three releases in the North Island, these have been made several months or more before the hunting season. The birds are then fed intensively so they remain at the release site. In one situation they simply supplement the opening day hunting on the pond to an unknown extent. In the other two examples hunters line up nearby and the birds are actively put off the pond. Unlike wild birds, in the examples I have seen the birds progressively leave the pond over 5 to 10 minutes depending on how much cover is available around the pond. Hunters either shoot them as they leave or alternatively wait until they return to the pond a few minutes later. In these examples the birds were in very good condition, larger than wild mallards and flew well creating challenging shooting, particularly flying back into the pond. To this end it seemed a very similar experience to shooting driven pheasants, something which is already permitted.

Where there is a significant difference is that upland game species are relatively sedentary and tend to walk rather than fly any great distance. By contrast mallards often travel far afield on a daily basis and in large flocks utilising a network of habitats that are often widely spaced. There is therefore a much greater risk that wild mallards will be attracted by the 'decoy' effect of large congregations of captive reared mallards on private property subject to intense feeding. Conversely if these captive reared mallards move off the property they may impact on the accuracy of aerial monitoring counts of wild mallards and on banding studies.

Questions

Is Fish & Game supportive of releasing CRMs as a tool to augment wild populations?

There appears no evidence that releasing CRMs is an effective tool to supplement wild populations. Proponents sometimes quote that wild mallards in New Zealand are all sourced originally from such releases as evidence that this may occur. However there is a significant difference between establishing a population that then becomes self-sustaining and augmenting an already existing

population which is likely already constrained by some ecological or environmental variable. Therefore this is not a valid justification for releasing CRMs.

Is Fish & Game supportive of releasing CRMs as a tool to hasten recovery of wild populations that are at low levels?

As above this is unlikely to work. Furthermore invariably the catalyst for such releases is to facilitate greater hunting opportunity and harvest at the very time when the wild component of the population is vulnerable to this. Therefore we do not support this practice.

Does Fish & Game support the concept of 'put and take' operations?

There is no definition of 'gamebird' in the Wildlife Act but Collins Dictionary for example defines it as 'a bird shot for sport or food'. Therefore that a mallard is reared with the intent to be taken by a gun is entirely consistent with its legal description. It does come down to a question of personal ethics and objectives; however for example, releasing pheasants to then be hunted is generally recognised as both legal and acceptable. It is difficult to see how hunting CRMs is significantly different.

One argument is that wild mallards may be attracted to the CRM operation impacting on opportunities for surrounding hunters. However where pond feeding is permitted then this is no different to the current situation where some landowners already feed out very large amounts of grain for example. It does however raise the issue of what provisions for feeding CRMs might be permitted in those regions that do not allow pond feeding?

The other potential impact is on monitoring studies. The problem of hunters becoming blasé about recovering banded birds and not reporting these bands can be largely overcome by requiring that CRMs are no longer banded. However that these birds may be included in aerial counts of the wild population will always be a risk. On the other hand if a more reliable and effective permitting system can be put in place then there should be a much more accurate estimate of where and how many CRMs are being released each year.

Overall and bearing in mind that 'put and take' pheasant operations are already permitted and valued by some licence holders then it is considered that similar CRM operations could also be allowed, within defined criteria.

Does Fish & Game accept the development of commercial CRM enterprises?

A significant difference between pheasant preserves and possible CRM operations is that there is likely to be a much greater component of wild ducks attracted to these properties. These are a resource that belong to everybody (a commons) and the Wildlife Act 1953 23(2) is quite specific that "*No person shall sell or let for fee or reward any right to hunt or kill game on any land or on any water on or adjoining any land*". Whereas for pheasant operations there is an argument that the birds are all reared on and at the cost of the property it is simply not equitable that the wild mallard and grey duck population is captured for commercial exploitation.

For the same reason if commercial operations were permitted they could not have different regulations from the surrounding area as to have the same wild population subject to two different sets of regulations depending which side of the fence it was on would be nonsensical.

In summary it is our opinion that commercial hunting of CRMs is not an acceptable development given the mobility of wild mallards.

If Fish & Game allows 'put and take' operations would we seek to control how they may be hunted?

How CRMs might be hunted is very much a case of personal ethics and what some hunters feel is appropriate may not be shared by other hunters – no different as to the debate around other hunting practices such as pond feeding and mechanical decoys.

From a purely pragmatic perspective it would appear very difficult to regulate anyway. For example what is the difference between driven hunts and the age old practice of jump shooting farm ponds where the hunters are often lined out below the dam heading. Perhaps the biggest concern would be the development of practices where the birds were released and shot direct from the pen, such as the use of towers as practiced in North America. While some North American hunters are obviously happy to pay for this experience, we suggest most NZ hunters and indeed the general public would find this step too far. To that end perhaps the issue is most easily resolved by requiring that as a condition of any permit to release that the birds are released as juvenile birds several months prior to Opening Weekend.

Other considerations?

The legalities regarding the current operation of commercial pheasant preserves are murky to say the least. However these ventures are operated in good faith and firmly entrenched in today's world. A legal opinion is being sought as part of this review and should this support that such operations are ultra vires then it will be necessary to amend the legislation to legitimise commercial upland game properties.

Secondly, currently permits to release birds (S56 Wildlife Act 1953) are issued by Department of Conservation under delegation from the Director General of Conservation. This authorisation is often granted remotely and independent of any input from the relevant Fish & Game region. Clearly where these permits involve the release of gamebirds then Fish & Game need to be directly involved. Resolving this (and related issues like Permits to Disturb (S54)) is essential to effectively and efficiently managing pheasant and CRM 'put and take' operations, both from a management perspective and that of the licence holder.

RECOMMENDATIONS

That with respect to the 5 questions from National Council listed in the agenda that Taranaki Fish & Game Council;

1. Is NOT supportive of releasing CRMs to augment wild populations
2. Does NOT support the use of CRMs to hasten the recovery of wild populations
3. Does SUPPORT the concept of 'put and take' operations to provide hunting opportunity
4. Does NOT accept the development of commercial CRM hunting operations
5. Does NOT agree with trying to define hunting practices other than a requirement that all CRM's should be released several months prior to the gamebird season

6. In addition Council supports clarification of the legislation regarding commercial pheasant preserves
7. The Council Strongly Supports Fish & Game seeking an effective mechanism to undertake the administration of permits to release and disturb gamebirds under the Wildlife Act

Glenn Maclean

Regional Manager

18 January 2018

Glenn Maclean

To: gmaclea@fishandgame.org.nz
Subject: FW: Submission on Captive Reared Mallard's Please forward to all Fish and Game Councillors and Managers
Attachments: email Andy Garrick CRM.docx

From: Jeff Niblett [<mailto:jeff@nzgamebirds.co.nz>]

Sent: Sunday, 21 January 2018 10:06 PM

To: Martin Taylor <mtaylor@fishandgame.org.nz>

Subject: Submission on Captive Reared Mallard's Please forward to all Fish and Game Councillors and Managers

Dear Mr Taylor

The following is my submission on Captive Reared Mallards. Could you please make sure this is circulated to all of the regional managers and all NZ and Fish and Game councillors.

My name is Jeff Niblett. I am a director of New Zealand Gamebirds Ltd which was established in 2003. Our business is involved primarily with the rearing and supply of gamebirds, including mallards, for release. I am a current Hawkes Bay F&G councillor.

The New Zealand Council in May 2016 NZ Council meeting (item 30 on page 8) resolved that:

"That the NZ Council ask the Mallard Research Committee and any staff they think appropriate, to prepare a report on the risks and benefits of captive reared mallards and a recommendation so an SOP could be formulated to deal with requests for releases of captive reared mallards."

I support this approach and believe that any policy developed should be based on an impartial and independent assessment of the impact of captive reared mallards on the wild population. This task has however, not yet been completed as the memorandum prepared by staff contains no assessment of the risks and benefits. The memorandum also makes no recommendations on which a policy can be based. It also fails to take into account the results that Regional Fish and Game staff have found from their own experiences with recent releases of captive reared mallards in the Eastern and Wellington regions. Nor has it consulted with any of the license holders that are currently releasing mallards.

Regional councils have now been asked to make decisions on "put and take" operations without any accompanying information nor recommendations and consequently they are being asked to make decisions without the benefit of objective information which NZ Council had resolved to generate. There is no information provided relating to the effectiveness of the current Fish and Game endorsed "put and take" trout fisheries or pheasant preserves, all of which should be readily available and I would have expected to be included in the report. Both of these activities result in increased license holder participation through enhancing fish and game bird populations. This supports the function of the F&G Council, as specified by Section 26Q of the Conservation Act 1987, "to manage, maintain and enhance the sports fish and game resource in the recreational interests of anglers and hunters".

In the absence of the objective information which the report was expected to provide it is difficult to respond to the specific questions asked in relation to captive reared mallards. We do however have an existing legislative and policy framework for the rearing, release and hunting of upland game birds which addresses all the issues put to the regional councils for consultation in relation to mallards. I believe it would be sensible and consistent to apply the same framework currently used for upland game birds to mallards and I would support this approach.

In relation to the releasing of fish and gamebirds, this is also supported, in the NZ Fish and Game Council constitution under the Conservation Act (S26Q(b)(ii)) as a means of maintaining and enhancing populations. Fish and Game are tasked with maintaining and improving the fish and game resource by maintaining hatchery and breeding programmes where required for the stocking or restocking of habitat. It is further endorsed in regional Sports Fish and Game Management Plans.

Given the steep and continuing decline of mallard populations over the past 15 years it would suggest that Fish and Game should support and encourage the release of captive reared mallards in order to meet the obligations it has under both the act and its constitution.

I agree with all of Murray Williams findings. The releasing of mallards will not result in any long term resurrection of the mallard population once seen in the past. It should however be noted that these findings are all based on overseas experience and as Murray Williams points out data is mainly based on migratory populations which is significantly different to New Zealand's situation. The results are also likely to be based on CRM's that have been reared in captivity for many years where birds have been specifically selected for captive breeding. The NZ CRM's so far have all been first or second generation offspring from wild stock. Having had direct experience with CRM's in the UK and NZ our observations are that these birds behave quite differently to each other. NZ CRM's behave much more like wild birds than those the UK.

This would further support the need for Fish and Game to include information from the recent releases in any report that they are requested to produce.

To add further to this discussion I have attached an email from Andy Garrick (personal communication 15th Dec 2017) which details the findings of Eastern Fish and Game's staff on the 199 mallards that we supplied them in Jan 2016 to help further their own knowledge of CRM's.

These mallards were released on two sites with supplementary feeding and some predator control. Twelve months later a number of birds were recaptured (26/100 and 10/99) clearly indicating that not all of these birds have died of starvation or been predated. These results show that

1. They have added to the local population.
2. They have had the chance to add to breeding success (for these birds were recaptured after surviving through a breeding season).
3. They have contributed to hunter harvest and satisfaction.

Therefore CRM's can obviously add significantly to local populations. The evidence that Fish and Game has on survival of fledged ducklings (telemetry study) showed very good survival of tagged fledglings through to the shooting season. Their recent work on nesting mallards would indicate that nest survival and brood survival is when predation is having the biggest effect. It is our experience that releasing CRM's gets birds passed this critical period of poor survival. If CRM's are able to breed successfully, which is supported by observations of current releases (and would not be surprising since the current wild mallard population all originated from CRM's ability to breed successfully in the wild) then there is the possibility that in conjunction with predator control releasing CRM's (at 6-8 weeks) can significantly add to localised mallard populations.

These findings would be backed up by F&G consulting with current private releases and including its own experiences of the staff in Eastern region.

Since 2003 NZGB has reared and released over 500,000 pheasants and 20,000 ducklings. These gamebirds have clearly resulted in enhancement of the populations, promoted sustainable hunting and significantly increased hunter participation and satisfaction. Licence holder participation last year, on three preserves in Hawkes Bay that we were involved with organising, resulted in over 10,000 hours of hunter effort and direct participation. To date there have been no reported adverse effects on the wild gamebird population. All gamebird license holders have had the opportunity to benefit from releases as both mallards and pheasants have spilled over onto public land.

Furthermore unlike the "Put and Take" fisheries it has all been carried out at no additional cost to license holders.

In summary I support in principle the release of mallards in line with the current legislative and policy framework and believe this is consistent with both the requirements of NZF&G under the conservation act and its own constitution”

Regards

Jeff Niblett



Jeff Niblett
Bridgette Karetai

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RELEASE OF CAPTIVE REARED MALLARDS

Meeting of NZ Fish and Game Council November 2017

Prepared by: Robert Sowman, Policy & Planning Manager, NZ Council Office &
Andy Garrick, Regional Manager, Eastern Fish & Game

1. PURPOSE

The purpose of this memorandum is to invite discussion on the release into the wild of captive reared mallards (CRMs) with a view to developing national policy for the guidance of regional Fish and Game Councils, the Department of Conservation (DOC), and people applying to DOC for authorisation to undertake this and related activities.

2. BACKGROUND

2.1 Overview

The rearing, supply and release of mallards into the wild is a growing enterprise in parts of the North Island, with the practice being promoted as a means of augmenting wild populations. Over the past 3 or 4 years we are aware of up to 6,500 birds per annum being released into sites in the Eastern, Hawke's Bay, and Auckland/Waikato Fish & Game regions. We understand that mallards have also been released into the Wellington region. Typically, groups of hunters purchase in the order of 100 up to 1,200 juvenile CRM each year and release these onto private land prior to the game season, where they are encouraged to remain or return, by ad lib feeding and a constant supply of food. Suppliers of the mallards maintain the position that they are not selling the birds but are solely seeking recovery for the costs of producing them.

Unlike pheasants on gazetted upland game properties with special conditions, bag limits and all other game season regulations for hunting wild mallards apply to the hunting of these released birds. However, interest has been expressed, in the Eastern Region if not others, in obtaining dispensation for less restrictive bag limits at specific locations/properties where CRM have been released. There have been indications from some quarters too, of a desire to establish commercial operations along the lines of those run by a number of upland game properties.

There are a variety of potential issues and downsides associated with the release of CRM. Some of these could be significant if not appropriately recognised and provided for via conditions attached to the permits by DOC. These are issued to individuals or collectives to undertake these activities (e.g. to capture, rear, hold, transfer and/or release birds). Some issues, however, may not be able to be addressed via such conditions.

Potential issues relate to genetic introgression and behavioural and morphological maladaptation in captivity, disease, compliance and law enforcement, impacts on wild mallard monitoring programmes, negative impacts on hunting opportunities in neighbouring areas, public perception, legislation (buying and selling of birds and hunting opportunity), and additional workloads for Fish & Game staff.

On the other hand, the concept theoretically has potential upsides, including augmentation or re-establishment of depleted wild populations, and additional or alternative opportunities for hunters.

There is therefore a need to develop national policy and/or guidelines to determine whether Fish & Game NZ is supportive of, or wishes to promote the release of CRM and if so, what conditions or controls should apply to the practice.

2.2 Legal Position

The Wildlife Act 1953 is the key legislation governing the catching, holding, rearing, transfer and release of game birds, and the sale of game and shooting rights. The following provides an overview and brief commentary of the provisions of the Act relevant to this agenda item.

2.2.1 First Schedule - Wildlife Declared to be Game

The First Schedule specifically provides that the mallard or associated mallard hybrid is wildlife that is declared to be game for the purposes of the Wildlife Act. The declaration in the First Schedule is not restricted by any reference to “not being a domestic bird” or similar caveats/delineation.

However, the Schedule creates a distinction between pheasants that are deemed to be game versus pheasants that are deemed to be domestic birds – a distinction that does not apply to mallards or other gamebirds. That distinction is elaborated on in the definition of a “domestic bird” in s2, which provides that the restriction in relation to pheasants being defined as domestic birds is limited to pheasants bred/raised for the predominant purpose of sale of pheasant meat or live pheasants for human consumption, excluding:

1. Any pheasant living in a wild state; or
2. Any pheasants held pursuant to a permit under sections 23, 53 and 56 for the purposes of liberation at large as game “shall not be deemed to be a domestic bird”.

The effect of this is that a pheasant that is bred/held in captivity for subsequent liberation to be hunted/killed as game is similarly defined as “game”.

2.2.2 Section 2 - Interpretation

Game is defined as “all animals and game birds for the time being specified in the First Schedule”. The First Schedule specifically provides that grey and mallard duck and any associated hybrid, are wildlife declared to be “game”. In order for a captive mallard to be defined as a “domestic bird”, it would have to be accepted that a general reference to any domestic duck overrides specific mention of the mallard duck as “game”.

Wildlife means any animal living in a wild state, and includes any such animal, egg or offspring of any such animal held, hatched or born in captivity. In turn, the definition of animal includes any bird not considered a domestic bird.

The discretion to grant/decline permits under sections 23, 53 and 56 in relation to wildlife, (including game) for these activities rests with the Director-General of Conservation as opposed to Fish & Game, notwithstanding Fish & Game’s statutory role in the management of game populations and setting of associated hunting regulations.

2.2.3 Sale of Game and Sale of Shooting Rights Prohibited

Section 23(1) of the Wildlife Act provides that, subject to obtaining the prior consent of the Director-General of Conservation, it is lawful for a person to buy or sell game or game eggs. Such consent can be provided on a conditional basis.

It is noted that s26Q(b)(ii) of the Conservation Act contemplates Fish & Game Councils maintaining and improving the game resource by maintaining hatchery and breeding programmes where required for the stocking or restocking of game habitat. Hence, game breeding/stocking is an anticipated Fish & Game Council function. Further, it is legally

permissible under the Wildlife Act for individuals to undertake this activity, subject to their holding the necessary permits under sections 23, 53 and 56 of the Act.

However, people undertaking these activities cannot legally sell or let the right to hunt or kill liberated mallards, including those bred/raised in captivity, because of the restriction in s23(2) of the Wildlife Act.

The real issue from Fish & Game's perspective is whether the Director-General of Conservation is required to consult with Fish & Game in exercising that discretion to provide consent to buy or sell game or game eggs and, if so, the extent to which they are required to take into account Fish & Game's view(s).

It seems somewhat inappropriate that consent is to be obtained from the Director-General of Conservation, rather than Fish & Game, given that Fish & Game Councils are specifically tasked with management of game populations, with issuing licences to hunt or kill game (see s26Q of the Conservation Act) and with setting regulations in relation to the harvest of game by way of Game Notices promulgated under the Wildlife Act.

As a minimum requirement, the Director-General of Conservation and delegated staff should consult with the relevant Fish & Game region in light of Fish & Game's specific statutory functions in relation to game.

Furthermore, any decision making by the Director-General of Conservation and delegated staff should take account of the relevant sports fish and game management plan for the relevant Fish & Game region.

Notwithstanding that someone may be able to legally buy or sell game or game eggs, including mallards and their eggs, it remains unlawful under s23(2) to sell/let for reward the right to hunt or kill game on any land or on any water-adjointing land. This means that if someone legally purchased mallards for liberation, they cannot subsequently legally sell the right to hunt them.

2.2.4 Director-General may Authorise Taking or Killing of Wildlife for Certain Purposes

Section 53(1) provides that the Director-General of Conservation may authorise a specified person to catch or kill game for an approved purpose if such hunting or killing is not permitted at the time.

2.2.5 Restrictions on Liberation or Export of Animals, Birds, etc

Section 56(1) provides that, subject to obtaining the prior consent of the Director-General of Conservation, it is lawful to liberate wildlife, which - as explained above - includes game birds such as mallards. Under s56(2) this approval can be granted on either a conditional or an unconditional basis. The Director-General or delegated staff should consult with Fish & Game in making any such decision regarding liberation.

2.3 Biological, Behavioural, Ecological, and Operational Considerations

2.3.1 Overview

As indicated earlier, there are potential concerns of a biological, behavioural and ecological nature, e.g. genetics/development of maladaptive traits; disease transmission; negative interaction with wild mallards; and interspecific hybridisation. There are also matters of an operational nature that need to be evaluated in relation to monitoring and management of wild populations (e.g. impacts on aerial transects/counts, banding studies, harvest surveys, population estimates, and regulation setting); reduced hunting opportunity in neighbouring areas (decoy effect of large numbers of released birds in an area and/or cafeteria feeding); and issues relating to compliance and law enforcement (arising from the concept of 'property rights', where more liberal hunting regulations have been approved for properties on which CRMs have been released, compared to the regulations applying elsewhere).

There are however, potential benefits that could arise from releasing mallards, e.g. as a tool to hasten the recovery of wild populations that are at low levels as a consequence, for example, of a series of poor breeding seasons or serious botulism outbreaks, or over harvesting (as opposed to a lack of quality habitat); providing 'put and take' hunting for groups of hunters at specific locations akin to that provided by upland game properties; and providing additional hunting opportunity for game bird hunters more generally and/or further afield.

Earlier this year Fish & Game commissioned an independent review by Dr Murray Williams of the potential pros and cons of releasing CRM into the wild in New Zealand. His key findings are outlined below. The full report was considered by Fish & Game managers in August 2017, who agreed it be accompanied by commentary by the legal and ethical practices and forwarded to the NZ council with a recommendation that it be circulated for consultation to regions.

Managers agreed Dr Williams' full report needs to be read in its entirety prior to determining whether or not, and under what circumstances, the release of CRM is something that Fish & Game should support or enable.

2.3.2 Synopsis Extracted from Dr Williams' Report (note that where provided, *italicised* page references relate to discussions on the topic concerned in the main body of the report)

- This report provides a review of literature detailing the nature and scale of releases of captive-reared mallards (CRMs) internationally, and the efficacy and biological consequences for wild mallards of these release programmes. Drawing upon those findings, it outlines the potential consequences (positive and negative) of more extensive mallard releases in New Zealand.
- A distinction is made between "put-and-take" releases, which are intended to improve hunter opportunity and satisfaction, and releases designed to supplement the wild mallard population.
- Large-scale releases of CRMs dominate in Western Europe and United Kingdom; 3-5 million are released annually and the bulk of mallards shot by hunters are released birds. Numbers released considerably exceed the wild mallard population resident or wintering in many European countries.
- Prolonged captive-rearing of mallards in Western Europe has resulted in birds being released having larger bodies, reduced flight capability, greater human tolerance and reduced anti-predator responses relative to wild mallards - all a consequence of captive mallards being selected for captive rather than wild traits. None of these changes have yet become manifest in the wild population.
- Despite captive-rearing facilities having been identified as potential concentrations of disease, transfer of diseases from captive to wild birds has not yet been detected in either Western Europe or USA. The reverse has, however, been detected (*e.g. transfer of influenza virus from wild birds to captive birds*), and throughout Western Europe, captive flocks and wild birds are kept separate during winter months. Newly-released captive birds lack immunity to wild pathogens and have been found to act as amplifiers of avian flu viruses already circulating in the wild.
- In the USA, there is a century-long tradition of releasing CRMs onto commercial hunting preserves. There is an equally long record of State and Federal wildlife management agencies releasing CRMs to augment wild mallard populations, especially in response to major declines in wild mallard populations.
- In the USA, large-scale releases of CRMs to supplement the wild population have conflicted with State and Federal waterfowl management activities, including population monitoring, band reporting rates, and annual harvest surveys. Similar conflicts have arisen in Nordic countries.

- In the USA, such has been the lamentable ineffectiveness of all releases intended to supplement wild mallard populations that Federal and most State agencies no longer do so, and instead focus on habitat creation and enhancement under the North American Waterfowl Management Programme. A plethora of published research has failed to demonstrate anywhere that population supplementation has worked without complementary habitat-focused initiatives.
- Private releases of CRMs in New Zealand, conducted under permits (*Wildlife Act 1953*) issued by the Department of Conservation, are (knowingly) of 5-year duration and, most recently (2017), resulted in 6000 mallards being released within 4 North Island Fish & Game regions. Since 2012, the DOC has issued 36 permits to individuals or corporate bodies to release mallards, and for periods of 3-11 (mostly 5-7) years (*refer pp 8, 9*).
- All CRMs released are required to be banded, and banding details supplied to the DOC Banding Office. There is already strong evidence for bands retrieved from released CRMs being hoarded and not reported to the Banding Office, or not being reported in the year(s) in which the birds were shot. Thus, determining what proportion of the released birds are shot is problematic. Inevitably, bands from wild birds will be caught up in any reluctance to report a band (*refer pp 10, 11, 12, 15*).
- In New Zealand, CRM releases should be viewed as intended solely to improve hunter opportunity and satisfaction. The wild mallard population is constrained by habitat availability and quality, and habitat expansion and management is the key to its expansion. Releasing CRMs as a stand-alone response to its modern decline will prove entirely ineffective (*refer pp 13, 18*).
- CRM releases are regulated by permits issued by the Department of Conservation. Fish & Game Councils, having statutory responsibilities to manage the gamebird resource, are not formally involved in approving permits and/or setting permit conditions. They should be (*refer p 14*).
- CRM releases have the potential to compromise some of Fish & Game's waterfowl monitoring and assessment activities (*refer pp 14, 15*).
- The requirement to band all CRMs released is challenged because it is without obvious purpose, may compromise band returns from wild mallards, and imposes an unnecessary burden on the DOC Banding Office and Fish & Game administrations (*refer p 15*).
- CRM releases pose no identifiable disease risk to the wild mallard population, nor to its size or genetic integrity (*refer pp 16, 17*).
- The potential for present-scale private CRM releases to expand into commercial-scale waterfowl hunting preserves is foreshadowed (*refer p 14 and Appendix 4*).

2.4 Public Perception, Animal Welfare, and Philosophical Considerations

In his report, Dr Williams notes on page 3:

“There is considerable variability in the way mallard “put-and-take” operations are conducted in Europe, UK and USA, and much of this is a response to the cost of maintaining birds in confinement, or in the wild, for the protracted interval between fledging and the onset of the hunting season. For example, commercial facilities that breed and hold birds for multiple weeks (or months) are compensated by high prices for the birds they sell or for the right to hunt on their preserve. In Europe, most sales of mallards from duck farms are as downy ducklings and the costs of maintenance are born by the hunters, hunters’ organisations, or estates that undertake the releases. Other approaches include releasing birds onto selected ponds at 6-12 weeks of age and maintaining the birds there by constant provisioning until the commencement of the hunting season”.

And on page 22:

“In most countries where restocking takes place, regulations or guidance that define best practice are limited or non-existent. Furthermore, current practices differ considerably from one country to another. In France, Mallards mostly come from a handful of breeding facilities that sell day-old ducklings. Such birds are then hand-reared in aviaries in the region of release, which generally occurs at the age of 6–9 weeks, about two months before the start of the hunting season. In order to keep hand-reared Mallard on the hunting estate, the provision of corn, wheat or rice is common practice. Hand-reared Mallard are thus likely to be highly faithful to the place where they were released, at least until the hunting season commences”.

On page 13:

“The mallard in New Zealand has lost places in which to live in safety and in which to breed successfully. Unless this loss of space and habitat quality is addressed, releasing CRMs into the wild to increase population size will be without enduring effect. And in the absence of appropriate habitat management there will be some who may consider such releases to be ethically questionable given that most, or all, ducks released will knowingly starve, or be predated”.

In Appendix 2 he describes some of the approaches and manner in which hunting of CRMs takes place overseas:

“Traditionally, shooting preserves released their flighted mallards from towers. This release method consists of holding birds in pens until their release from high towers and their flight directed towards waiting hunters. The hunters are positioned on a flight path towards a pond with which the birds are familiar, and released birds not shot but which land in the pond, are trapped and taken back to pens or, if they are trained to do so, return to the pens by themselves. This method of release is cost-effective, since most birds are either shot immediately upon release or the survivors are later gathered up and contained for a subsequent release. An estimated 70% of the CRMs are shot immediately on their release (USFWS 2013). This “put-and-take” method prevents the CRMs intermingling freely with wild ducks, and ensures few escape to the wild.

However, a liberal interpretation of USFWS regulations saw shooting preserves adopt another release method whereby greater numbers of free-flying CRMs mallards were released and the birds “trained” to move freely among several impoundments on the preserve that serve as feeding and loafing areas. Once they are released, the birds are not trapped or put back into captivity, but instead visit flooded grain crops and other feeding sites which the preserves provide. In this way the ducks remain on, or near to, the preserve. While hunters derive a more “wild” hunting experience, fewer of the CRMs are shot (approx. 40%; USFWS 2013) and a greater number escape to mingle with the wild population”.

It is unclear the extent to which predator control and supplementary feeding are undertaken at sites into which CRMs are released in New Zealand, and whether these activities continue beyond the end of the game season. The manner in which CRMs are harvested in New Zealand is also unclear, though staff are aware that some of the hunters who release birds hunt them from their maimai as they would wild birds. Anecdotal reports have been received from third parties, however, that driven hunts are also conducted, in which birds are encouraged to fly over hunters from one point to another, e.g. between feeding and roosting areas. Reports have also been received of birds being spotlighted on ponds, and birds that were reluctant to fly being chased into the air.

These are matters that need to be considered from a public perception and/or animal welfare point of view.

There is similarly a need to consider the philosophical and judicial appropriateness of authorising the captive rearing and release of mallards for ‘put and take’ operations - particularly if these were to be

commercialised given the history and intent behind Fish & Game and its predecessors, and the organisations' 'reason for being'.

3. FISH & GAME'S POSITION

As a precursor to drafting policy, Fish & Game needs to determine what its position is in relation to the following matters:

- (i) Is Fish & Game supportive of releasing CRMs as a tool to augment wild populations?
- (ii) Is Fish & Game supportive of releasing CRMs as a tool that could be used to hasten the recovery of wild populations that are at low levels as a consequence for example, of a series of very poor breeding seasons or serious botulism outbreaks arising from climatic conditions, or over harvesting?
- (iii) Does Fish & Game support the concept of 'put and take' operations where CRMs are released for the principal purpose of providing an immediate hunting opportunity?
- (iv) If the latter is something Fish & Game wishes to facilitate, support or promote, would we accept the development of commercial enterprises run along the lines of many upland game operations, or would we require 'put and take' operations to be of a non-commercial nature only? [An argument to consider is if Fish & Game allows commercial pheasant/quail/partridge hunting, should it not also allow commercial exploitation of mallards or other gamebirds and change the law to enable this if necessary?].
- (v) If Fish & Game allows release of 'put and take' operations, would we wish to see the birds hunted in a similar way to how wild mallards are hunted now, or would we be accepting of the upland game equivalent of 'driven hunts', where birds are encouraged to fly over hunters from point A to point B, or some other approach?

Once these questions have been answered, and any others that might be raised, policy, criteria, and conditions or controls can be developed.

4. RECOMMENDATIONS

That the New Zealand Council:

- (i) receives Dr Williams' report and notes his key findings**
- (ii) agrees to make it available to interested parties with an invitation to provide comment on it back to the NZ Council by 1 March 2018**
- (iii) agrees to send Dr Williams' report and this memorandum to Fish and Game Councils asking them to respond by 1 March 2018 to each of the five questions raised under 3. Fish & Game's Position above.**

Releasing Captive-reared Mallards in New Zealand

A synopsis of international experience with the release of captive-reared mallards into the wild, and a consideration of issues pertinent to its practice in New Zealand

Compiled for New Zealand Fish & Game Council by Murray Williams

May 2017

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SYNOPSIS

- This report provides a review of literature detailing the nature and scale of releases of captive-reared mallards (CRMs) internationally, and the efficacy and biological consequences for wild mallards of these release programmes. Drawing upon those findings, it outlines potential consequences (positive and negative) should existing mallard releases in New Zealand become more extensive.
- A distinction is highlighted between "put-and-take" releases which are intended to improve hunter opportunity and satisfaction, and releases designed to supplement the wild mallard population.
- Large scale releases of CRMs dominate in Western Europe and United Kingdom; 3-5 million are released annually and the bulk of mallards shot by hunters are released birds. Numbers released considerably exceed the wild mallard population resident or wintering in many European countries.
- Prolonged captive-rearing of mallards in Western Europe has resulted in birds being released having larger bodies, reduced flight capability, greater human tolerance and reduced anti-predator responses relative to wild mallards, all a consequence of captive mallards being selected for captive rather than wild traits. None of these changes have yet become manifest in the wild population.
- Despite captive-rearing facilities having been identified as potential concentrations of disease, transfer of diseases from captive to wild birds has not yet been detected in either Western Europe or USA. The reverse has however, and throughout Western Europe, captive flocks and wild birds are kept separate during winter months. Newly-released captive birds lack immunity to wild pathogens and have been found to act as amplifiers of avian flu viruses already circulating in the wild.
- In USA, there is a century-long tradition of releasing CRMs onto commercial hunting preserves. There is an equally long record of State and Federal wildlife management agencies releasing CRMs to augment wild mallard populations, especially in response to major declines in wild mallard populations.
- In USA, large-scale releases of CRMs to supplement the wild population have conflicted State and Federal waterfowl management activities, including population monitoring, band reporting rates, and annual harvest surveys. Similar conflicts have arisen in Nordic countries.
- In USA, such has been the lamentable ineffectiveness of all releases intended to supplement wild mallard populations that Federal and most State agencies now longer do so and instead, focus of habitat creation and enhancement under the North American Waterfowl Management Programme. A plethora of published research has failed to demonstrate, anywhere, that population supplementation has worked without complementary habitat-focussed initiatives.
- Private releases of CRMs in New Zealand, conducted under permits issued by the Department of Conservation, are (knowingly) of 5 year's duration and, most recently

(2017), resulted in 6000 mallards being released within 4 North Island Fish & Game regions. Since 2012, the DoC have issued 36 permits to individuals or corporate bodies to release mallards, and for periods of 3-11 (mostly 5-7) years.

- All CRMs released are required to be banded, and banding details supplied to the DoC Banding Office. There is already strong evidence for bands retrieved from released CRMs being hoarded and not reported to the Banding Office, or not being reported in the year(s) in which the birds were shot. Thus, determining what proportion of the released birds are shot is problematic. Inevitably, bands from wild birds will be caught up in any reluctance to report a band.
- In New Zealand, CRM releases should be viewed as intended solely to improve hunter opportunity and satisfaction. The wild mallard population is constrained by habitat availability and quality, and habitat expansion and management is the key to its expansion. Releasing CRMs as a stand-alone response to its modern decline will prove entirely ineffective.
- CRM releases are regulated by permits issued by the Department of Conservation. Fish & Game Councils, having statutory responsibilities to manage the gamebird resource, are not formally involved in approving permits and/or setting permit conditions. They should be.
- CRM releases have the potential to compromise some of Fish & Game's waterfowl monitoring and assessment activities
- The requirement to band all CRMs released is challenged because it is without obvious purpose, may compromise band returns from wild mallards, and imposes a needless burden on the Department of Conservation Banding Office and Fish & Game administrations.
- CRM releases pose no identifiable disease risk to the wild mallard population, nor to its size or genetic integrity.
- The potential for present-scale private CRM releases to expand into commercial-scale waterfowl hunting preserves is foreshadowed.

1. INTRODUCTION

1.1. Background

This report responds to a request for information about the nature and scale of releases of captive-reared mallards *Anas platyrhynchos* (hereafter referred to as CRMs) internationally, and the efficacy and biological consequences of these programmes. A substantive literature citation was requested to accompany this review. From the information assembled, an outline of potential consequences (positive and negative) of such a programme becoming established in New Zealand, was requested.

There is a certain irony in this request. CRMs have previously been released in large numbers in New Zealand, when it was a case of turning a blind eye to all possible consequences but one – establishing mallards in the wild.

All historic Acclimatisation Societies were participants in this exercise⁽¹⁾, to which they committed substantial resources. They approached their singular objective in very different ways e.g. by establishing their own game farms, by contracting the breeding to private game farmers, by encouraging their members to run small back-yard breeding and release operations, by buying birds from other Societies, and by conducting repetitive, small, and widely-scattered releases. The outcome was a minimum 30,000 mallards released into New Zealand wetlands, with serious efforts commencing in the 1920s, and pursued with vigour in the 1940s and 1950s. The releases persisted until 1974. Thus, all New Zealand's mallards descend from captive-reared ancestors whose forebears were, in turn, sourced from United Kingdom game farms, and one USA game farm^(1,37).

Elsewhere, captive-rearing and release of mallards for sporting interests has a multi-century history in UK and Western Europe. Today, it almost entirely fuels waterfowl hunting in France, and much of Western Europe; at least 1.4 million mallards are released annually in France and about 3 million across Western Europe^(2,3). In UK, at least 400,000 were released annually in the 1980s⁽⁴⁾ but that number may now considerably exceed 1 million^(5, Appendix 3). In USA, it has been a feature of shooting preserve management from about the 1920s; in 2001 for example, approximately 300,000 mallards were released on 270 shooting preserves along the eastern (Atlantic) flyway (South Carolina to Maine) and especially in the state of Maryland⁽⁶⁾. However, in USA, it has also played a role in efforts to supplement the wild population^(7,8).

1.2. Philosophical basis for releasing CRMs into the wild

Two intentions are usually advanced for releasing CRMs into environments in which mallards already occur: to improve hunter opportunity and satisfaction, and to supplement the wild population.

1.2.1. Improving hunter opportunity and satisfaction. This is often referred to as a "put-and-take" practice. To maximise effectiveness, the birds are released as close as possible to the time of hunting, and are released into the immediate area in which hunters intend to shoot. Classic examples include the release of upland gamebirds from cages/crates and made to fly towards a line of waiting hunters. Similarly, the release of mallards is from towers (tower shoots) and the birds directed to fly to nearby ponds across a line of waiting hunters.

There is considerable variability in the way mallard "put-and-take" operations are conducted in Europe, UK and USA, and much of this is a response to the cost of maintaining birds in confinement,

¹ References are identified in the text by superscript numbers e.g. ⁽¹⁾, and are listed in numerical sequence at the end of the document.

or in the wild, for the protracted interval between fledging and the onset of the hunting season. For example, commercial facilities that breed and hold birds for multiple weeks (or months) are compensated by high prices for the birds they sell or for the right to hunt on their preserve. In Europe, most sales of mallards from duck farms are as downy ducklings and the costs of maintenance are born by the hunters, hunters' organisations, or estates that undertake the releases. Other approaches include releasing birds onto selected ponds at 6-12 weeks of age and maintaining the birds there by constant provisioning until the commencement of the hunting season⁽⁶⁾.

By whatever method "put-and-take" is practised, its persistence is dependent on the hunters receiving an experience that they consider is "worth the money", and the great majority of those providing these hunting opportunities are commercial operations. Nowhere in Western Europe, USA, or UK are State wildlife agencies involved in "put-and-take" practices, other than in a regulatory role, but I am unsure whether hunters' collectives have practical involvements.

1.2.2 Supplementing the wild population. A perceived or real decline in a wild population can be the stimulus for releases of captive-reared birds. Simply adding birds is viewed as a way to make things better.

While supplementation using captive-reared stock is a practice supporting several NZ endangered bird conservation programmes e.g. for brown teal, blue duck, black stilt, their success is utterly dependent on the causes of decline being addressed e.g. predation, habitat destruction. [As a graphic example, releases of c.1000 captive-reared brown teal into regions of Northland 1984-1994 failed to establish a single new population of this endangered duck, nor increase any existing population; no complementary environmental management accompanied these releases⁽³⁶⁾.] The same requirement exists for supplementation of gamebird populations to prove effective. The number of ducks in any area reflects the distribution, abundance and quality of their habitat i.e. the "carrying capacity" of the environment. Adding more ducks without providing more habitat, or having improved the existing habitat e.g. by predator control, providing escape cover, increasing food supply and/or wetland areas, simply induces immediate competition between the resident and released birds until, by death or emigration, the number quickly returns to that which the environment previously supported. On the other hand, supplementing a population after a heavy mortality event e.g. from excessive hunting or seasonal disease like botulism, may assist its recovery more quickly than by natural processes alone, but only up to its former size.

Evidence of the ineffectiveness of supplementation as a stand-alone response to population decline is widely chronicled in literature from the past 50 years, and especially so from USA (see Appendix 2) where the topic has been researched *ad nauseam*⁽⁷⁾. Nevertheless, the practice persists because of its seductive simplicity and because it may also provide an immediate, albeit temporary, increase in the number of birds available to local hunters.

2. INTERNATIONAL EXPERIENCE ARISING FROM RELEASES OF CRMS

2.1. Western Europe, USA and UK

The scale and consequences of CRM releases in Western Europe are described in Appendix 1. A shorter summary of the practice in USA is given in Appendix 2, and the current meagre knowledge of UK operations provided in Appendix 3. Detail for the summary comments provided in this section

are provided in those appendices, as are numerous web-site links that can provide further understanding.

It is important to stress just how different from New Zealand the circumstances are in these three regions.

The major ecological difference is migration; high latitude-breeding mallards winter in warmer southern regions and the entire ecology of mallards in Western Europe, Asia and North America is dominated by the constraints imposed by the migratory journeys and the shortness of breeding seasons in the high latitudes.

CRMs, as potential hunter quarry, are generally released into the mallard's winter range. In USA, however, CRMs released as an attempt to augment the wild population may be so in both the breeding and winter ranges. In Western Europe, UK, and USA, a small proportion of the mallard population remains year-round in the lower latitudes and wintering grounds. Many of these birds reside within urban or peri-urban environments where behavioural tolerance of human presence, and a dependency on human-supplied foods has arisen – little wonder that CRMs tend to join them⁽¹⁵⁾. It is with the wild migratory population that CRMs initially interact prior to, and during, the hunting season but it is with these resident birds that CRMs fortunate enough to survive the hunting season intermingle and breed⁽⁵⁾.

In New Zealand, by contrast, mallards are remarkably sedentary (see Fig. 1, section 3.4) and there are no significant seasonal movements, except for some late summer movements to and from larger wetlands for moulting. CRMs, once released, have the potential to intermingle and elope with resident wild mallards.

The major environmental difference is the scale of the release programmes and, especially in UK and Western Europe, the extent to which CRMs now dominate the hunting take. Can we conceive of CRMs being released here in numbers that are 3–10 times the number of resident wild birds, as occurs in the Camargue region of France⁽⁵⁾ and in Czechoslovakia⁽⁴⁾ ?

The biological and regulatory consequences of CRM releases in these Northern Hemisphere regions should be viewed within the context of extensive seasonal movements and concentrations, and the sheer scale of the releases.

2.2. Biological consequences

The biological consequences of the practice, as identified in these countries, can be summarised thus:

2.2.1. Genetics and captive adaptation. The long captive history of farmed mallards, and their development of characteristics that enhance captive breeding and management e.g. for egg production, has resulted in farmed mallards having lower genetic diversity than wild mallards, and they are now able to be discriminated from wild mallards by modern genetic tests^(4,16). Physical changes in bill morphology (from eating solely large food items e.g. pellets, corn) and body size, reduced flight capability, greater plumage variability, a dependency on food provisioning by humans, tameness, and reduced anti-predator response are also manifest in farmed birds^(17,25).

Maladaptive traits can be transmitted into the wild population by breeding between captive-reared and wild mallards. Although genetic typing of farmed and wild mallards (in Czechoslovakia) demonstrated a low (4–7%) hybridisation between them, interbreeding has been advanced as an explanation for the decreased seasonal mobility of mallards now apparent in southern France^(4, 16). Because of poor post-release survival (in both USA and Europe) there has been little contribution of farmed mallards to the breeding stock of resident populations; in three US studies, only 0–12% of farmed mallards that nested in the wild produced broods^(18,19, 26).

Nevertheless, field studies in Western Europe and North America are not convincing on the extent of genetic “pollution” of wild mallards by CRMs, and the “problem”, frequently expressed, seems one more of potential than of reality. A differentiation between resident and migratory mallards⁽¹⁶⁾ is telling and suggests the interaction is almost entirely with the non-migratory segment of the population.

2.2.2. Disease transmission. In USA and Europe, captive-rearing facilities have been identified as potential concentrations of disease (and especially of avian flu viruses^(3, Appendix 1)). Avian flu viruses, duck virus enteritis (“duck plague”), and avian cholera are the three diseases of greatest concern⁽⁸⁾. In Belgium, for example, farmed birds, by having no immunity to any avian flu virus, are believed, upon release, to act as local amplifiers of flu viruses already circulating in the wild⁽²⁰⁾. No routine disease screening of released birds is practised anywhere in Europe but there is disease surveillance in all member states of the European Union (M. Guillemain *pers.com.* to MW)

However, I am not aware of any literature confirming the transmission of deleterious disease or pathogens from CRMs to wild birds. On the contrary, there is evidence of the reverse e.g. influenza virus taking hold in captive flocks following contact with migratory wild birds (as in Denmark, July 2016). Keeping wild and farmed ducks separate during winter months is now a standard protocol across Europe⁽³⁾ (see also Appendix 1).

2.2.3. Inter-specific hybridisation. This is an issue unique to USA where, in the south, releases have occurred into what were the exclusive breeding ranges of two closely-related but non-migratory species, mottled duck (*A. fulvigula*) and Mexican duck (*A. diazi*), and which have extended the mallard’s year-round range. Extensive hybridisation and introgression² has followed, and one regional population of Mexican duck is now extinct. The extensive releases in north-eastern US states have added further to the competitive interactions and extensive hybridisation between mallards and American black duck (*A. rubripes*)⁽⁸⁾.

2.2.4. Hunting impact. Within southern France where CRMs have been released amongst wild mallards, total bags have increased but mortality rates of wild mallards have not increased i.e., CRMs have borne the brunt^(21,22,23). The same is believed to occur in UK (see Appendix 3). In USA, wild mallards sustain all hunting outside of the hunting preserves.

2.3 Regulatory and Management issues

2.3.1. Population management and monitoring. Large-scale releases of CRMs in localized areas of eastern USA conflict waterfowl management programs, including aerial survey to monitor winter

² Introgression is the transfer of genetic material from one species to another as a result of hybridisation between them and the hybrid subsequent breeding with either of the parental species.

populations, breeding population survey, banding reporting rates, and harvest surveys⁽⁶⁾. Similar concerns have been expressed in Nordic Europe⁽²⁴⁾.

2.3.2. Regulatory enforcement. The inability to distinguish between CRMs and wild ducks, either in flight or on the water, and on or off shooting preserves, is at the heart of US law enforcement angst⁽⁶⁾. While some US state regulators have attempted to resolve this by restricting duck hunting on their licensed shooting preserves to the same dates as their regular State-wide duck seasons, it is a source of constant friction and, seemingly, not always honoured⁽⁶⁾. I have been unable to find literature describing how this issue is managed (if at all) in Europe but in UK all hunting of waterfowl, whether on estuaries or estates, is restricted to a standard winter season. The hunting of migratory waterfowl throughout Europe and Northern Africa is governed by international treaty under the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) and for which prescriptive guidelines, including season timing and lengths, have been developed⁽³⁾.

3. CAPTIVE-REARED MALLARD RELEASES IN NEW ZEALAND

3.1. Historical perspectives

That captive-rearing and release established mallards in New Zealand confirms the efficacy of the technique. However, a closer inspection of details indicates it was not without initial challenges, with the released birds remaining close to their sites of release and only slowly expanding into the countryside and, thus, being able to be hunted⁽¹⁾. In effect a re-wilding of game-farm stock had to progress, and the mallard's eventual establishment was aided by land clearance that created open grassland landscapes in which the mallard had an ecological advantage over the declining native grey duck (*A. superciliosa*)⁽⁹⁾, and by the sheer number and persistence of the releases.

Two evaluations of CRM releases occurred late in the acclimatisation era; releases by several Acclimatisation Societies 1950–1955⁽¹⁰⁾, and by Southland Acclimatisation Society 1954–1963⁽¹¹⁾. These releases formed part of the Acclimatisation Societies' programmes of establishing mallards in their districts, and were made in the face of expanding local mallard populations, and hunting. These evaluations were possible because a requirement for all released mallards to be banded had just been imposed, allowing the release outcomes to be analysed within the same context as banded wild mallards.

Evaluation of the 1950–1955 releases (by Tauranga, Wellington, Stratford, and four other Acclimatisation Societies) was summarised thus⁽¹⁰⁾:

"First-year recovery rates for hand-reared mallards were only 40% of those for wild-trapped birds. Of 3238 mallards liberated from game farms only 166, or 5.1%, were recovered by hunters in the year-of-banding; for wild-trapped birds, a total of 4683 banded yielded 597 recoveries, or 12.7%. For every wild mallard shot in the year-of-banding at least two and one-half hand-reared birds would have to be liberated to furnish the same return in the shooting bag."

The locations of recoveries of the 166 hand-reared birds indicated that 153 (92.2%) were from within 25 miles (40 km) of the release site and 97.6% within 50 miles (80 km)⁽¹⁰⁾.

The Southland releases of 1954–1963 were more extensive and the summarised results were⁽¹¹⁾: “8195 mallards were liberated at 261 sites throughout the province. Some releases were made into refuges and only 6109 were regarded as being available for sport. Releases were made at 7-8 weeks of age and spring *cf.* late summer releases yielded similar hunting returns. A total of 915 (15%) hand-reared mallards were reported shot, 583 (9.5%) in the year-of-banding. This is a lower recovery rate than for wild mallards in Southland. First-year mortality rate was 60.3% with those still alive at the beginning of their 2nd year having an average further life of 2.1 years. This mortality rate is higher than for wild mallards in Southland but comparable with wild mallards elsewhere in NZ and lower than for hand-reared mallards released elsewhere in NZ”.

With respect to movements, “the ducks did not travel far; over 70% were recovered within 10 miles (16 km) of their liberation sites. This sedentary tendency favours the supplementing of local populations with hand-reared stock”⁽¹¹⁾.

These two appraisals are from an era so long ago, and into an environment so different from that of today, that they are uncertain predictors of outcomes of releases of CRMs today. However, they share the finding that proportionately fewer CRMs than wild mallards were shot by hunters, indicative of high post-release mortality of the hand-reared birds.

3.2. Contemporary releases of CRMs

Keeping mallards in captivity, and releasing CRMs into the wild, both require authorisation under the Wildlife Act (1953, and its subsequent amendments and replacements). Permits to do so are issued by the Department of Conservation (DoC).

The DoC advised (27 April 2017) that, since 2008, it had issued 36 permits to individuals or collective bodies to hold mallards in captivity, 6 permits to breed mallards in captivity for release, and 35 permits to release of mallards from captivity into the wild. The numbers of mallards permitted to be released in each calendar year was given as:

2008, 2009, 2010, 2011 – all “no record”; 2012 – 900; 2013 – 1733; 2014 – 2033; 2015 – 1483; 2016 – 3883.

Although 6 permits have been issued for mallards to be bred in captivity for release, only one commercial facility is understood to be breeding mallards for supply (as eggs or other life stages) and for release into the wild: New Zealand Gamebirds Ltd. of Sherenden, Hastings (A. Garrick, Eastern F&G, *pers com.*). The scale of this operation is not known to the author and I leave it to NZ Fish & Game to seek this commercial information from NZ Gamebirds Ltd. The captive-reared birds are required to be banded prior to release, and the banding details provided to the DoC Banding Office. Annual banding totals provided by the DoC Banding Office (to Eastern F&G) were:

2012 – 1180; 2013 – 1426; 2014 – 6561; 2015 – 907; 2016 – 4832

NZ Gamebirds Ltd. advised (to Eastern F&G) that 6090 mallards were banded and released in 2017 (3130 distributed within Auckland/Waikato, 1550 in Eastern and 1380 in Hawkes Bay F&G Regions).

Totals given above contradict banding totals and banding location data provided to the author (as electronic files) by the DoC Banding Office. For example, in 2013, 1851 mallards had their banding/release location as “Sherenden”, 500 as “Bracu, Bombay” (a site at which 700 were

distributed in 2017), 225 to "Stuart Deadman, Taupo" (a site at which 1200 were released in 2014, and a release site in 2017), and another 700 at three sites not used by F&G as banding sites; thus at least 3276 can be identified for 2013. And to add to the uncertainty, three of four release sites for 2013 known to Auckland/Waikato F&G are not recorded in the banding totals and location data DoC provided to the author. Additionally, the 907 releases reported for 2015 seems distinctly low relative to numbers from other years and may be in error, or, alternatively, could indicate the release of unbanded birds.

In short, these DoC-supplied figures should be viewed as minimal. The 2017 figure supplied by NZ Gamebirds Ltd. indicates the present size of its operation, and is the best available indicator of present demand for CRMs.

3.3. Permit conditions applied to retention and release of CRMs

I was provided with copies of 14 of the 36 permits DoC had issued to individuals or collective bodies to hold mallards in captivity. These permits, all issued between 2014 and 2016, were obtained by Eastern F&G under a 2016 Official Information Act request.

Permits were issued for periods of 3-11 years (5, 6 and 10 most common). Numbers permitted to be held and released ranged from 120 to 1200 per year, but two permits did not specify numbers and four referred to a number without indicating whether that was a per-year or overall total. The eight permits which specified an annual total collectively allowed 3050 CRMs to be released annually. All but two required permit holders to provide an annual report to DoC and the local F&G office, four requesting details of birds held, birds bred and birds released, five just number released, while three did not specify the detail required. Two permits specified details of release procedure (from an open-topped pen), and three the minimum age for release (8 weeks). Three permits specifically stated that the birds remained the property of the Crown. No permit made reference to location(s) of intended releases.

A feature of these permits was the considerable variation in "special conditions" with the 2016 conditions including multiple clauses about banding requirements. Overall, the permit conditions could be described as "labile", and inconsistent.

With respect to disease screening and monitoring requirements associated with the keeping and release of mallards, the DoC advised (27 April 2017) that

- "some Authorisations contain conditions requiring the authority holder to ensure birds are free of avian disease at all time and some Authorisations contain conditions requiring authority holders to periodically examine the birds to ensure individuals are healthy. No follow up is undertaken by the Department to ensure these conditions are complied with."
- "some Authorisations contain conditions requiring the authority holder to ensure the birds are free of avian diseases prior to being released and some Authorisations contain conditions requiring authority holders to examine and ensure every individual bird is healthy prior to release. No follow up is undertaken by the Department to ensure these conditions are complied with".

Thus, regard for animal health and welfare is deputed to the permit holder.

3.4. Dispersal and recovery of CRMs after release

Distances moved by CRMs from their sites of release within the Eastern and Hawkes Bay F&G regions (and, for comparison, by wild mallards from their sites of banding) are illustrated in Figure 1.

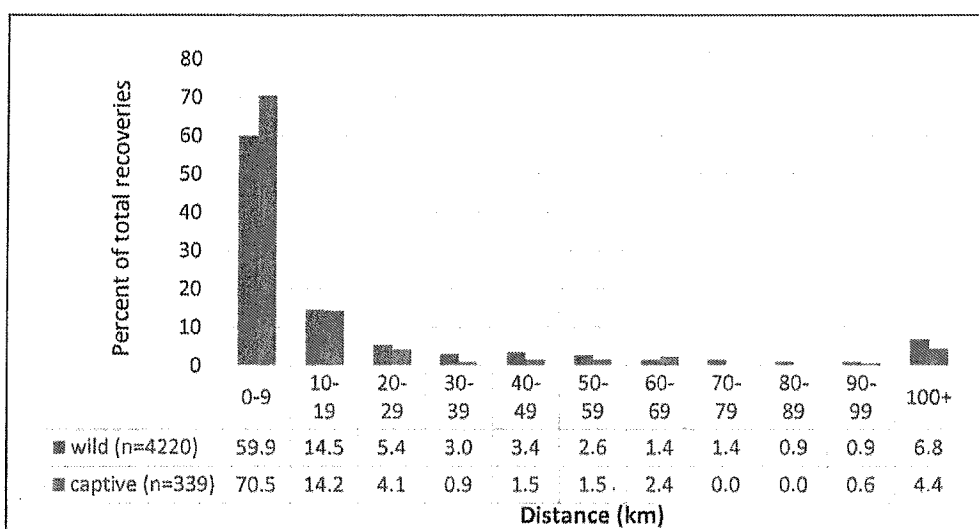


Figure 1. The distributions of distances between site of recovery and site of release or banding of CRMs and wild mallards respectively. (Source: Eastern F&G).

The significant point is that 70% of CRMs and 60% of banded wild mallards reported shot in the Eastern and Hawkes Bay F&G regions were recovered within 10 km of their sites of release or banding, and there is essentially no difference in dispersal patterns of CRMs and wild birds. For the CRMs, the extent of their dispersal is essentially the same as that recorded in the two historic studies referred to earlier^(10,11). [Note: for summary purposes, short distance movements and recoveries from the actual site of release/banding have been combined in the 0-9km distance interval].

Comparative survival estimates have not been calculated. However, of more immediate interest may be the “year-of-banding” recovery rates, the percentage of the released ducks shot and their band reported during the hunting season immediately following release. The higher the percentage recovery rate, the more successfully CRMs have survived their initial period after release and contributed to the hunters’ bags.

Table 1. Percentage of CRMs reported shot in the hunting season following their release (Source: DOC Banding Office).

Year	No. CRMs released	% reported shot in year of release
2013	1426	5.0
2014	6561	2.8
2015	907	23.3
2016	4832	16.8

Taken at face value, the variability in these figures is confusing. How can they differ to this extent from year to year? The simplest, and perhaps the most obvious, explanation is that many bands retrieved from the 2013 and 2014 releases have not been reported to the DoC Banding Office.

A similar analysis of band returns from CRM releases in Auckland/Waikato region provides evidence for bands being retrieved but unreported in the year(s) in which the birds were shot (Table 2).

Table 2. Recoveries of bands from CRMs released and shot in the Auckland/Waikato Fish & Game Region 2012-2016. (Source: D. Klee, AWF&G).

Year	No. CRMs Released	Recoveries in 2012	Recoveries in 2013	Recoveries in 2014	Recoveries in 2015	Recoveries in 2016	% reported shot in year of release
2012	598	24	48	81	1	2	4.0
2013	2339		187	430	20	29	8.0
2014	504			103	11	1	20.4
2015	2610				172	75	6.6
2016	3036					227	7.5

The pattern of reported recoveries across the years in Table 2 is clearly erroneous. For example, that more CRMs were shot in the third hunting season after release than in the previous two seasons combined (as for the 2012 releases) is nonsense. Returns for the 2013 releases are also erroneous. A normal pattern of recovery is demonstrated by returns of bands from wild juvenile mallards banded in Eastern F&G region at much the same time (Table 3).

Table 3. Recoveries of bands from wild juvenile mallards banded in Eastern Fish & Game region 2011-2013 and reported shot 2011-2015. (Source: M. McDougall EF&G).

Year	No. banded	Recoveries in 2011	Recoveries in 2012	Recoveries in 2013	Recoveries in 2014	Recoveries in 2015	% reported shot in year of banding
2011	719	85	35	12	1	5	11.8
2012	724		83	19	11	5	11.4
2013	780			96	21	8	12.3

Invariably, recoveries are greatest from the hunting season immediately following banding (i.e. in the year-of-banding), with numbers declining appreciably in each of the following years. Furthermore, a relatively consistent percentage of each annual banded sample being reported shot in their year-of-banding is expected. This pattern is not a feature of Table 2, especially for 2012 and 2013 cohorts, and returns for the 2015 cohort in 2016 also appear inflated; they are simply not plausible.

That there might be site-specific variability in the reporting of bands retrieved from CRMs is indicated from an analysis of bands recovered from birds released at 5 sites in Auckland/Waikato F&G region (Table 4).

Table 4: Percentage of CRMs released at 5 sites in Auckland/Waikato region, 2012 and 2013, reported shot in their year of release (Source: D. Klee, AWF&G).

AWF&G region release site	Year of release	No. CRMs released	% reported shot in year of release
Opuatia	2013	499	5.4
Candy Rd	2013	299	29.1
Aria	2013	249	6.8
Aspin Rd	2013	199	27.1
Matingarahi	2012	103	20.4

This focus on band recovery rates for CRMs, and their comparisons with wild banded mallards, is of relevance to the management of the wild population. It provides a graphic example of how a basic management tool (banding ducks to determine survival rates and movements) can become corrupted by band familiarity or lack of hunter co-operation. When hunters experience a saturation of banded birds, whether arising from limited dispersal of birds away from a constantly-used banding site, or by mass retrieval of banded CRMs within a restricted area, invariably significant numbers of bands are not reported to the Banding Office. In consequence, false survival estimates will be derived which, in turn, will result in erroneous harvest regimes being recommended. This matter is further discussed in Section 4.2.3 below.

Suppliers and purchasers of CRMs might also want to reflect upon the recovery rates of their ducks. The year-of-release recovery rate is probably the best indicator of the success, or otherwise, of their "put-and-take" intent. Presently, the very best recovery rates listed above indicate four CRMs are required to be released for each one the hunter bags; recovery rates below 10% indicate a minimum of 10 must be released for the hunter to bag just one (very expensive) duck. Furthermore, by having bands from CRMs returned in the year in which they were shot, a measure can be derived of the extent to which CRMs survive both their release and their initial hunting season and thus have the possibility of joining the wild population.

In summary, the variability of recovery rates of CRMs in Tables 1, 2 & 4 makes little sense other than if, in some years and places, bands have been reported *en masse* without regard to the year in which they were obtained, and in other years and places, hardly reported at all. Some recovery rates are half, and others twice, that for wild banded mallards^(10,12,13,14) and are also very different from the historic Southland recovery rates⁽¹¹⁾. The DoC-supplied banding totals have already been shown to be questionable (see section 3.2 above) and are also at variance with the Auckland/Waikato totals given above. There is no certainty that any of these summations is based on verifiable totals of recoveries; a recent study of 1997–2013 mallard bandings⁽¹⁴⁾ reported that 31% of alleged band returns (as reported in hunter interviews) could not be traced in the DoC banding database, and a similar estimate of misreporting was apparent in an unpublished Auckland/Waikato study⁽¹⁴⁾.

These recovery rate figures for CRMs should be considered unreliable and not used to guide policy development.

4. APPLICABILITY OF CRM RELEASES IN NEW ZEALAND

Mallard is New Zealand's most widely distributed and most numerous waterfowl^(27,28). It is ubiquitous throughout New Zealand's farmed landscapes, occupies urban and peri-urban wetland and park environments, may be encountered in estuaries, has reached and established on Chatham Is. and all other of New Zealand's remote islands, and has dispersed to Australian territories.

Widespread and numerous it may be, nevertheless it has found intensification of pastoral lowland agriculture a challenge. Although there are no surveys or censuses of mallards to give emphasis to recent population changes, a significant decline is apparent in NZ Fish & Game's estimated harvest figures from surveys of hunters over the past two decades⁽²⁹⁾. In Table 5 below I have randomly selected three years, each a decade apart.

Table 5. Estimated number of ducks harvested during each game season (Source: NZF&G hunter survey).

Island	Year	Mallard + "grey"	Paradise
North	2016	213,226	83,562
	2006	268,730	73,487
	1996	328,166	42,151
South	2016	218,517	41,416
	2006	259,873	49,273
	1996	370,724	45,663

Leaving aside the possibility of a decline in number of hunters over this 20-year period, the fact that, in both islands, the estimated harvest of mallards (plus greys) has declined by at least a third (and halved in Auckland/Waikato and Eastern), and that, in North Island, Paradise Shelduck harvest has doubled, is glaringly symptomatic of the landscape change we have all seen, and wherein ephemeral wetlands are no longer a conspicuous feature. An overlooked contributor, also, is the rampant increase in life-style blocks (holdings <40 ha) which have doubled in number since 1996 to 175,000 by 2011 and cover 873,000 ha⁽³³⁾, most of which are maintained as quasi-parks.

Wetland-dependent species have suffered, grassland-dependent species (including Canada goose) have thrived.

This is the ecological context against which releases of CRMs into New Zealand should be viewed.

4.1 Release of CRMs - for what purpose?

Releases with the intent of supplementing the wild population are pointless. As mentioned earlier, evidence of the ineffectiveness of supplementation as a stand-alone response to population decline is widely chronicled in literature from the past 50 years, and especially so from USA (see Appendix 2) where the topic has been researched exhaustively⁽⁷⁾. The mallard in New Zealand has lost places in which to live in safety and in which to breed successfully. Unless this loss of space and habitat quality is addressed, releasing CRMs into the wild to increase population size will be without enduring effect. And in the absence of appropriate habitat management there will be some who may consider such releases to be ethically questionable given that most, or all, ducks released will knowingly starve, or be predated.

Providing increased hunting opportunity in restricted localities, however, can be achieved by releases of CRMs, especially if some on-site care e.g. food provisioning, predator control, is also applied. This is a well-established approach overseas, and is already being permitted by DoC as private activity on private land in parts of North Island. Presumably current multi-year practitioners of "put-and-take" mallard hunting have their hunting expectations met by this technique.

Whereas rural land-owners (and their hunting friends) may now be able to adopt "put-and-take" mallard hunting, demand from urban-based hunters has the potential to grow. It is a relatively small step, logistically, from CRM releases being a private initiative to becoming a commercial activity, and it has a precedent in the establishment of game preserves for commercial hunting of upland gamebirds. The circumstances that promoted the development of shooting preserves in USA (see Appendix 4) e.g. growing proportion of urban-based hunters lacking rural contacts for hunting opportunities, paucity of hunting opportunities near large urban centres, land-use conversions incompatible with hunting, reduced game abundance and stricter harvest regulation etc., are very obviously at play in New Zealand.

4.2. Points for consideration

Before a widespread implementation of releasing CRMs for supplementary hunting opportunity is adopted, the following points may be worthy of consideration.

4.2.1. Regulation of releases. Wild capture, captive-breeding, and liberation of mallards are subject to conditional permits issued by the Director-General of Conservation under the Wildlife Act 1953 (and its subsequent amendments). The Director-General of Conservation appears to have the absolute discretion to permit any action otherwise illegal under the Act. Discretion also exists, under Section 53 (3,4) (as amended in Section 80 of Conservation Law Reform Act 1990), for this permitting authority, in respect to species declared to be game, to be transferred to a (and any) Fish and Game Council.

The present administrative process relegates the agency with statutory responsibility to regulate and manage game bird hunting to being neither a consenting authority for releases of CRMs nor an obligatory partner to the issuing of permits. It is entirely possible that a release of mallards may be allowed into an area in which F&G management activities are undertaken (e.g. banding for harvest and survival studies), or into an area specially managed by Fish & Game as a place of special significance ecologically and a lingering haven for endangered grey duck (as has been allowed at Opuatia wetland, Waikato⁽³⁰⁾).

Potential considerations could include:

- DoC transferring the permitting authority to F&G, and/or
- the relevant regional F&G Council being required to provide comment to DoC on all permit applications to inform whether granting of the permit would be prejudicial to its statutory and management activities, and for DoC to give full effect to F&G's response.

4.2.2. Population management. USA experience⁽⁶⁾ indicates that releases of CRMs without regard to prevailing natural conditions, and at places where CRMs cannot readily be discriminated from wild birds, can complicate or compromise population monitoring and assessment activities. In New Zealand, population assessments made in the interval between releases of CRMs and the onset of the hunting season e.g. aerial transects, pond counts, are particularly at risk of being "corrupted" while any harvest assessments based on return of wings or bands, or on hunter telephone surveys,

similarly may not reflect wild mallard exploitation rates accurately. Such assessments lie at the very heart of sustainable waterfowl hunting and management.

However, rather than take a blanket approach by accepting that "...yes, CRMs can corrupt management programmes", I would encourage a more considered and analytical response to determine where, how, and under what circumstances, each current Fish & Game management activity might be influenced by releases of CRMs, if at all.

4.2.3. Banding. Why are CRMs all being banded? This is a condition of all DoC permits and the requirement to "mark" released birds for subsequent identification is a statutory requirement under Section 39 of the Wildlife Regulations 1955. What may not be understood is that this practice arose in 1950 when the Wildlife Branch, Dept. of Internal Affairs, commenced banding wild waterfowl and upland game. Wildlife Branch sought to discriminate between wild birds and the mallards and pheasants then being released by Acclimatisation Societies (many releases were haphazard and without record). It established its own banding administration to keep track of all gamebird banding and releases. Banding of all released birds has persisted, unquestioned, since that time.

Banding is a research and management tool. It is used to obtain necessary information. Where it serves no informative need, its practice must be questioned, indeed it should not occur. Thus, I encourage reflection on:

- whether discrimination between CRMs and wild mallards is necessary (why, and by whom?);
- the impact of banding on the operations of the DoC Banding Office.

Banding of wild ducks is not a conspicuous management activity of all Fish & Game Councils. For example, there has been no duck banding programmes by South Island Councils since the formation of F&G Councils in 1991. In North Island, there have been two enduring banding programmes of significance since that time (Eastern 1997-2017, Auckland/Waikato 2002-2017), and Wellington has just commenced (from 2015). Combined, these three F&G programmes will result in 6-8000 ducks being banded annually. The banding and release of, for example 6000 CRMs in 2017, is almost numerically equivalent to the F&G programmes. If (and it is an unknown and big if) bands from all recovered CRMs are reported to the banding office, and their recovery rate is twice that of banded wild birds (12.4%⁽¹⁴⁾), then two-thirds of all duck bands reported to the Banding Office will come from CRMs. For what purpose? At what, and whose, expense?

Another potential, and important, consequence of banding all CRMs will be to diminish band return rates locally. Limited duck dispersal, and hunter saturation with bands from birds whose travels are always short-distance and thus without novelty, discourages hunters to report bands. This, in turn, can significantly affect essential dispersal and survival studies. This "band fatigue" has already been demonstrated in section 3.4 above.

Identification of CRMs in the hand can be achieved without affixing a leg band. Options include:

- Removal of the alula (the vestigial wing claw) from the wing. It is a simple and bloodless procedure that can be done on unfledged or fledged ducks alike. This technique is used in USA⁽⁶⁾ to discriminate CRMs in hunting season wing surveys.
- Affixing a tiny numbered bird band to the basal shaft of the 2nd or 3rd primary feather. This is a commonly-employed technique in conservation studies and is highly effective for identifying scavenged carcasses where, often, just the wings and pectoral girdle are found.

- Punching a small hole in the web of the foot.

Any marking technique (including banding) applied should be fit for purpose and without impact on the animal. Marking birds without purpose is unacceptable.

4.2.4. Hunting regulations. Regulations that seek to give exclusivity to a hunting site, or to a time-period outside of the normal game hunting season, will be challenged to ensure the harvest of released birds is separated from that of wild birds also frequenting the hunting site. This has proved an almost insurmountable problem for shooting preserves in USA⁽⁶⁾ and the outcome, in many States, has been the imposition of regulations that restrict timing to the statutory hunting season, but which often compromise on bag limits. It is an ongoing source of angst.

None of the permits examined which allow the release CRMs in New Zealand confers an opportunity to hunt the birds other than under the gazetted regulations applying in the relevant Fish & Game region at that time. However, should preserves for the hunting of mallards become established in New Zealand, conflict about hunting periods will undoubtedly arise.

Enshrined in this debate, however, is the notion of property rights; "I paid for them therefore they are mine and I can shoot the lot if I want". Some, but not all, of the permits examined specifically state that "the birds and any of their progeny (dead or alive) and eggs (if any) are to remain the property of the Crown....." If not so stated, once a CRM is released, any presumed property right is foregone anyway (Section 57(3) of Wildlife Act 1953) and the birds are treated as wild birds. While subsequent hunting is subject to the bag limits and hunting methods applying in the relevant Fish & Game region at that time, the potential for disregard of the law is obvious.

Two other clauses of the Wildlife Act 1953 may also be easily transgressed without site-specific permitted conditions stating otherwise; that applying to provision of food at a hunted site (designated area) within 30 days of the commencement of the hunting season (Section 17(2)), and taking of game at a site where live birds may serve to decoy others (Section 18 (1) (f) (i)).

Prudent management for released CRMs might include the provision of food to ensure their survival during the difficult period of adapting to life in the wild. It is also a technique for ensuring the CRMs do not disperse away from their site(s) of release. One possible interpretation of Section 17 of the Wildlife Act 1953 is that hunting is permissible beyond 100m from any site at which CRMs are fed in the 30-day period prior to the hunting season. Thus, a fed site containing a flock of CRMs could draw wild birds from the surrounding landscape, and to the benefit of hunters shooting close by. Are provisions of the Wildlife Act 1953 being transgressed?

4.2.5. Disease transmission. Determining the role of CRMs in the epidemiology of wild waterfowl diseases has proved challenging, as outlined (section 2.2.2). In the absence of empirical information, much international focus has centred upon the alternative approaches of risk mitigation, or of containment.

In the New Zealand context, those two contrary points of view are expressed. One arises from those managing rare species and captive management programmes that seek to augment tenuous wild populations. For example, the DoC has strict disease management and screening protocols governing the release into the wild of animals bred in captivity, and especially so for conservation management purposes. Blue duck and brown teal are examples of waterfowl subjected to these

quite onerous protocols. This approach is strongly supported by international protocols e.g. *Guidelines for wildlife disease risk analysis*⁽³¹⁾ compiled by the IUCN, and is a perspective vigorously advocated by the Zoo industry. The concern is the transmission of disease or parasites from captivity to the wild population. Intriguingly, DoC does not seek to establish the disease or parasite status of the recipient wild populations as part of its management approach.

The other viewpoint is that of the Ministry of Primary Industries (MPI) which is responsible for biosecurity matters, including disease outbreak containment, and biosecurity at the borders. As part of the latter, MPI undertakes disease screening of wild mallards at duck banding stations in the Eastern and Auckland/Waikato Fish & Game regions. Its focus is on pathogens which pose a health risk to humans, farm stock, and wild native animals (e.g. virulent strains of avian influenza). New Zealand's geographic isolation is a significant constraint on the natural arrival of waterfowl diseases like duck virus enteritis or H5N1 and other recent strains of avian influenza; we are not a migratory destination for Northern Hemisphere waterfowl, and vagrants are extremely few⁽³²⁾. Facilities breeding gamebirds in captivity are regarded as no different from those breeding poultry (Wlodek Stanislaw *pers com* to MW) and any biosecurity response would be one of disease containment following a notified outbreak, not routine and detailed screening just in case.

Thus, if Fish & Game seeks advice about the extent to which releases of CRMs pose a disease risk to wild waterfowl, the response received will likely differ according to the management paradigm of the agencies concerned. In the meantime, it is worth reflecting that poultry and game farm operators have a significant financial incentive to ensure disease or parasitic outbreaks do not occur. Poultry practice, for example, is to provide preventative antibiotic treatments via drinking water.

4.3. Genetic considerations – relevant concern or not?

Recent European studies have highlighted the genetic consequences to the wild population of widespread and abundant CRM releases (see Appendix 1), and similar comment occurs in US literature. This issue may be largely irrelevant to releases in New Zealand.

The scale and duration of overseas CRM releases are extremely different from that currently practised, or likely to be practised, in New Zealand – orders of magnitude different. New Zealand mallards are all descendants of CRMs, most of whose forebears derive from a limited number of UK game farms⁽¹⁾. Genetic diversity is already restricted. It is not as if the genetics of wild mallards throughout New Zealand will be corrupted by the small numbers of CRMs presently being bred and later released in a limited number of places. Furthermore, there would have to be a significant number of the CRMs surviving their initial hunting season and recruiting into the wild population for any genetic transfer to take place. However, any "concern" about genetic consequences to the wild population from CRM releases might be ameliorated if captive stock is regularly augmented by wild-trapped birds, and if protocols/regulations restrict the production and releases of birds to those no more than two generations removed from the wild.

Commercial breeders of mallards might be reluctant to keep introducing wild birds into their breeding stock. Selection for birds that breed well in captivity is economically understandable, and so too is the production of birds that are tame around humans and potentially less likely to dispersal away from the sites at which they are released for hunting purposes. Females newly taken into captivity will be less productive initially than those long held in captivity or which were raised in

captivity (as was the experience of grey duck and mallard breeding in the 1970s, and brown teal and blue duck conservation breeding programmes).

5. OVERVIEW

The release of CRMs can serve two purposes: to augment the wild population, or to provide enhanced hunting opportunity. These purposes should be viewed as mutually exclusive.

Releasing CRMs as a stand-alone remedial response to the obvious, and significant, modern decline in wild mallard numbers throughout New Zealand, however well intentioned, is ecologically unsound. The present abundance and distribution of wild mallards reflects the distribution, quantity and quality of its habitat. An improvement in abundance will follow an improvement in quantity and quality of habitat. This is the lesson from innumerable waterfowl management studies and experiments worldwide over the past 100 years^(7,8). It is the philosophical and practical basis upon which the world's most far-reaching waterfowl management programme, the North American Waterfowl Management Plan, is predicated and enacted⁽³⁴⁾. These ecological principles will apply no differently in New Zealand.

What some may wish to debate is whether there is "spill-over" into the wild population following CRMs being released to provide enhanced hunting opportunity locally. How many will survive their encounter with the gun? How significant could these numbers be? What happens to them? Notwithstanding the point made above, the international evidence is clear – the captive experience, even if quite short, nevertheless maladapts the duck for life in the wild. This abundant evidence also informs that, upon release, the duck's immediate survival prognosis is poor unless food, previously given, is continually provisioned, and safe habitat provided. Its likelihood of being shot when released for that purpose should be high, but should it survive the hunt, its further survival prognosis is lower than for a wild bird, its ability to reproduce successfully is lower than that of a wild bird, and it must compete with wild birds for both space and food. Any "spill-over" has been found to be a trickle. Nevertheless, it would be nice to have New Zealand data, and that will require the assiduous reporting of bands retrieved from shot CRMs, and in the year in which the birds were shot.

There is little reason to imagine a recovery in wild mallard numbers in New Zealand unless quantity and quality of habitat is improved. However, as current breeding studies in Southland⁽³⁵⁾ and Waikato (D. Klee *pers com*) are demonstrating, low nesting success and low recruitment rates are seriously constraining population growth. Tossing CRMs into the wind is not going to address that.

The release of CRMs in New Zealand should be seen solely as serving to enhance hunting opportunity and success in the immediate area in which the birds are released. That being so, the practice will persist, possibly even expand, while hunters' expectations are being met and the "put-and-take" procedure provides hunters with "value for money". An expansion from private initiative to commercial hunting preserve model, perhaps like that already available to upland game hunters, can be foreshadowed. Thus, the utility of existing regulations to manage the hunting expectations of those hunters purchasing or pursuing CRMs might emerge as important a consideration as any of the biological and management issues highlighted in this discussion paper. And what might be the expectations of Fish and Game Councils of hunters unable, or unwilling, to seek a commercial "put-and-take" hunting experience?

More immediately, however, there is foreseeable conflict between F&G's gamebird management responsibilities and activities and the DoC's willingness to provide permits to those who wish to breed and release CRMs for their own benefit. Permit conditions which lack site-specificity, are without regard for F&G's management activities, and are issued without any intention to monitor

compliance, are not conducive to a collaborative working relationship between these two natural resource management agencies.

Finally, the size and genetic integrity of New Zealand's wild mallard population is unlikely to become compromised by present-scale, or expanded, CRM releases. The greater risk will be to the integrity of F&G's research and management programmes upon which regulations for the hunting of the wild population are based.

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APPENDIX 1: A SYNOPSIS OF CAPTIVE-REARED MALLARD RELEASES IN EUROPE

Extracted without amendment from AEWA Technical Series No. 62, (2015): *Guidelines on Sustainable Harvest of Migratory Waterbirds*. Pp. 56-61. <http://www.unep-aewa.org/en/publication/aewa-conservation-guidelines-no-5-guidelines-sustainable-harvest-migratory-waterbirds-ts>

RE STOCKING FOR HUNTING

1. Current practice

Restocking for hunting involves the release of native captive-reared animals within the range of wild conspecifics to augment harvest opportunities. It is commonplace in Europe, and for waterbirds almost exclusively involves Mallard. Historically, the translocation and release of Greylag Goose (*Anser anser*) in order to increase goose shooting opportunities was also widespread in some countries, but large-scale restocking of Greylag Goose no longer occurs, although smaller releases to improve local hunting opportunities may take place.

Within Europe, recent research has significantly increased the general understanding of the issue (e.g. Champagnon 2011, Söderquist 2015), however it remains poorly monitored and the long-term impacts on wild conspecifics are not properly understood. This is in part due to a lack of licensing and regulation in most countries, and in part due to a lack of focus on the issue by hunting stakeholders. A comprehensive review of restocking was undertaken by Champagnon *et al.* (2012a).

Few accurate data exist about the scale of releases, but it is likely that more than three million Mallard are released annually in Europe. In some cases, the number of restocked individuals can be significantly greater than the wild population, e.g. in France c. 1,400,000 Mallard are released annually compared to a wintering population of c. 270,000 (Söderquist *et al.* 2013), and in the Czech Republic approximately 250,000 Mallard are released annually, exceeding the wild population by 5–10 times (Čížková *et al.* 2012). As restocking effort has increased, the transport of captive-reared birds has likely also increased. Eggs, ducklings and adults have been subject to extensive, and probably increasing, international trade for decades, certainly within the European Union and probably also at an intercontinental scale. [In UK an estimated 1 million CRMs are shot annually; the kill of wild mallards is estimated at a mere 10,000 (M.Ellis, BASC. *pers com* to MW; Appendix 3)].

The suitability of stocked birds for release is highly questionable (Čížková *et al.* 2012). In several European countries individuals from non-local populations have been used to establish captive stocks and hence the genetic status of released individuals is usually unclear. Captive-reared individuals may also have decreased genetic diversity compared to wild birds due to genetic drift and inbreeding (e.g. Earnhardt *et al.* 2004, Theodorou & Couvet 2004). Moreover, relaxed selection on traits that affect fitness under natural conditions may also have contributed to a phenotype shift in the captive-reared population (e.g. Bryant & Reed 1999, Lahti *et al.* 2009).

Information on the legal basis to restocking or the legal issues it raises are not readily available for most countries. Often this is because legislation concerns the release of non-native species, but not native species. In Norway, Mallard and Greylag Goose can be released for hunting, according to state regulations from 1999 (themselves based on the Wildlife Act 1981). Czech legislation dealing with the release of animals into nature imposes restrictions on the release of animals that are interspecific hybrids or hybrids with a domestic species, but enforcement in the case of Mallard is problematic as the general requirement of genetic purity of released individuals is not defined. The desirable genetic markers described by Čížková *et al.* (2012) could be used in the future for such evaluation of restocked Mallard.

In France, it is a legal requirement that captive-reared game birds are individually marked before release in order to separate them from wild birds, yet most Mallard are released unringed (Vittecoq *et al.* 2012).

2. Motivations and methods

The key motivation for restocking of huntable waterbirds is increasing hunting opportunity (hunter satisfaction), *which translates into increasing the profitability of the sale of hunting opportunity* (MW's emphasis). In most cases this means birds are released in areas that maximise the probability of them being hunted, but in some older restocking programmes, the goal was to get released birds to join the wild population or establish new ones, hence they were released in non-hunted areas (Wardell & Harrison 1964).

Champagnon *et al.* (2012a) outlined three main types of restocking practices: (i) release of adults after the hunting season to increase the subsequent breeding population, (ii) release of juveniles before the hunting season, to be harvested during the subsequent hunting season, and (iii) release of individuals during the hunting season.

In most countries where restocking takes place, regulations or guidance that define best practice are limited or non-existent. Furthermore, current practices differ considerably from one country to another. In France, Mallards mostly come from a handful of breeding facilities that sell day-old ducklings. Such birds are then hand-reared in aviaries in the region of release, which generally occurs at the age of 6–9 weeks, about two months before the start of the hunting season. In order to keep hand-reared Mallard on the hunting estate, the provision of corn, wheat or rice is common practice. Hand-reared Mallard are thus likely to be highly faithful to the place where they were released, at least until the hunting season commences (Champagnon *et al.* 2009).

Swedish game managers have long used Mallard eggs, ducklings, and adults imported from Denmark, which in turn also imports large quantities from abroad, e.g. France (Söderquist *et al.* 2013).

3. Consequences and impacts

A number of detrimental effects from restocking have been recorded on wild recipient conspecific (WRC) populations, and these may also extend to wild donor populations (i.e. wild populations that are harvested to provide stock for release elsewhere). Research demonstrates that restocking may cause a variety of significant disruptions to natural patterns in wild populations. Furthermore, intensive restocking activities may impact wetland ecosystems.

Whilst still significant in many cases, the impacts of releases are reduced due to the lower survival of released individuals which limits the extent of their recruitment into the WRC population. In some cases, there is evidence that most individuals are harvested during the first hunting season, i.e. few survive until the following breeding season. For example, Champagnon *et al.* (2012b) found that only 44% of Mallards released in the Camargue, southern France, survived from release until the start of the hunting season, and that just 11% remained by the onset of the following breeding season.

Nevertheless, whilst survival probabilities are low for individual restocked birds, the large number released means that enough can survive to form a significant proportion of the breeding population. Söderquist *et al.* (2013) found that even a conservative estimate of survival of restocked Mallard meant that such birds formed 1-5% of the national (Swedish) breeding population, though in reality this is a much higher proportion in the geographically limited areas where releases are concentrated. Champagnon *et al.* (2015) found that at the onset of the breeding season a minimum of 34% of the Mallards in Brenne region (central France) have captive origins.

In terms of direct harvest, the effect of restocked individuals on WRC populations appears variable. As restocking is designed to increase hunting opportunity, increased hunting pressure is to be expected and this may result in an increased harvest of wild birds as well as restocked individuals (Bro *et al.* 2006). Though the total harvest is spread among more individuals, over-harvesting of the WRC population is possible or even likely (Sokos *et al.* 2008), yet this is rarely if ever assessed. On the other hand, WRC populations may benefit from the release of captive-reared conspecifics if the latter reduce hunting pressure on the former.

Genetic pollution is an area of particular concern as it may threaten the integrity of WRC populations in a number of ways through introgression with captive-reared birds that, typically, have different genetic and/or geographic origins (Čížková *et al.* 2012). These mainly concern decreased genetic diversity arising from the limited number of individuals typically used for breeding purposes, and the more pronounced effects of genetic drift and inbreeding. The degree to which this introgression threatens wild populations through deleterious effects is less clear, but Čížková *et al.* (2012) concluded that the release of captive-reared individuals does threaten the genetic integrity of the wild population through gene swamping, whereby foreign, unadapted genotypes are introduced into a wild population. Furthermore, natural patterns of genetic variation and adaptation may be disrupted, leading to a reduction of a population's ability to adapt to future environmental change (Lande & Shannon 1996).

The stable environment experienced in captivity, together with inbreeding effects, can result in loss of crucial morphological adaptations. Generally, these changes are not welcome as such captive-reared morphological drift may be maladaptive in the wild environment. Morphological change arisen in captivity may affect wild populations if the traits are heritable and if wild individuals breed with captive-reared ones after release (Tufto 2001). Duck breeders tend to discard the most phenotypically atypical individuals, but subtle morphological differences between wild and domestic populations are sometimes not even visible (e.g. in Mallard; Byers & Cary 1991, Champagnon *et al.* 2010, Söderquist *et al.* 2014). Reduced flying ability is a common phenotypic defect of CRMs in the Czech Republic (Hůda; cited in Čížková *et al.* 2012), which reflects the short flight distances inferred from ring recoveries of released Mallards (see below). Furthermore, in other taxa, restocking of game species frequently introduces non-native genes because captive stocks may be a mix of different taxa or strains. This is not currently believed to be an issue for waterbirds, but best practice guidance for restocking needs to highlight this risk.

Migratory behaviour of WRC populations may also be altered through the introduction (and subsequent introgression) of sedentary stock (Champagnon *et al.* 2012a, Söderquist *et al.* 2013). Unnaturally high densities of birds may also cause behavioural changes. Adler (2010) found that the introduction of large numbers of Mallard led to regular forced copulations by groups of males, which may make feeding breaks dangerous (and therefore less frequent) for already exhausted incubating females.

Several factors make captive-reared animals particularly susceptible to infectious diseases, e.g. high population density, naïve immune systems, contaminated food, cross-species contact and stress (Lafferty & Gerber 2002). They, therefore, potentially have heavy pathogen loads that can be transmitted to wild populations, so-called 'pathogen spillover', when the two come in contact (Power & Mitchell 2004). Release of infected captive animals into the wild can then cause disease outbreaks, premature mortality, and otherwise reduce fitness and reproductive success of the wild population (Hudson *et al.* 1998).

Avian influenza virus (AIV) prevalence in captive-reared Mallard destined for release onto hunting estates in France has been shown to be highly variable but sometimes extremely high, approaching 100% of the tested birds (Vittecoq *et al.* 2012). However, no exchange of AIV between captive-reared birds and the WRC population was found, although it is considered likely. Further, it could not be determined if the captive-reared birds were the source of the virus or were themselves contaminated by surrounding wild conspecifics.

Nevertheless, even if wild birds were the original source, the high susceptibility of captive-reared birds to further infection makes them an important epidemiological reservoir and vector from which infection rates can be amplified and disseminated. Indeed, large numbers of captive-reared Mallard are transported prior to release, e.g. >400,000 Mallards are transported annually as eggs, chicks or adults from one single major poultry farm in France to other countries in Europe and North Africa (Champagnon 2011). Such activities can potentially quickly spread pathogens, such as highly pathogenic AIV, if such a strain were to develop in a breeding farm (Handberg *et al.* 2010).

Duck Viral Enteritis (DVE) has been associated almost exclusively with captive-reared or nonmigratory waterfowl in Europe, Asia and North America, and Mallards and Muscovy Ducks (*Cairina moschata*) are particularly susceptible (Gough 1984, Brand 1988, Brand & Docherty 1988, Gough & Alexander 1990). Sporadic outbreaks in wild waterbirds often follow contact with captive or released birds, but asymptomatic birds can also spread the virus for years through deposition of their faeces (Burgess *et al.* 1979, Burgess & Yuill 1982). Thus, the release of wildfowl for hunting has the potential to promote the incidence of DVE in wild populations with potentially catastrophic effects (Fox 2009).

Restocking may also negatively impact on wetland biodiversity as a result of high stocking densities or unfavourable management practices. Wetlands subject to dense stocking could add significantly to the mobilisation of carbon, nitrogen and phosphorus (Callaghan & Kirby 1996). Studies in Denmark have showed that lakes stocked with CRMs had significantly higher phosphorus concentrations in the water than those not subject to stocking, but it was not possible to establish cause and effect, especially because variation among unstocked lakes was so high (Noer *et al.* 2008). These authors highlighted that any effects from Mallard stocking on lake biodiversity was highly dependent on the nutrient status, with acidic, nutrient-poor waterbodies being more sensitive to change in elevations of phosphorus concentrations.

Mallard are usually released at wetlands that are managed specifically for them and not for biodiversity and the overall quality of the habitat. These wetlands are thus managed very artificially, e.g. such wetlands may support high densities of invasive species such as *Ludwigia repens*, and instead of controlling such invasive plants by implementing a dry period, site managers are more likely to use chemicals, such as glyphosate, in order to make the wetland suitable for released birds (Champagnon *et al.* 2013).

4. Code of best practice

Currently there is limited regulation and adherence to best practice regarding restocking programmes, nor is there adequate ongoing monitoring to provide data that can underpin the development of best practice guidance. Given this, the likely consequences of any restocking programme should be thoroughly evaluated before it is implemented. For restocking to continue on a sustainable basis that is compatible with sustainable harvest management of wild waterbird populations, there are a number of recommendations that should be implemented.

Given these negative impacts and the lack of regulation, restocking should, ideally, be discontinued and efforts instead invested in managing wetlands for wild ducks such that there is no need to further artificially enhance hunting opportunities. (MWs emphasis). However, if restocking continues, the following practices should be implemented in order to meet minimum requirements for the restocking programme to be compatible with the management and conservation goals of AEWA:

1. All countries where restocking schemes are carried out should develop and implement a registration system, such that records are maintained of the activities and practices of each restocking programme, including the provenance of released birds, the number released, and the number subsequently harvested;

2. All released birds should be individually identifiable through the use of metal rings or some other suitable marking method, and this information should be shared with national ringing programme organisers and other stakeholders;

3. Released birds should be the same genotype and phenotype as the local WRC population and not show phenotypic aberrations resulting from domestication / genetic drift, including subtle characteristics such as in bill morphometrics. This may require the development of a well-managed captive-breeding programme. Assessments of the genetic status of wild populations should be undertaken at suitable intervals;

4. Stock for release should be sustainably sourced (i.e. should not negatively impact any wild population, e.g. through over-harvesting of eggs or birds);

5. To help limit the adverse biological effects of restocking wild populations with captive-origin individuals, those operating restocking schemes should pay attention to the impacts of restocking and cease releasing birds for a period after a few generations;

6. The size of the captive population should be reasonably large and the number of released captive-reared individuals should be kept at a low level;

7. Captive birds should be isolated from wild birds in order to minimise the risk of disease transfer;

8. Captive birds should be subject to regular disease screening and vaccination;

9. Efforts should be made to minimise the number of released birds that survive and enter the wild breeding population, including efforts to harvest as many as possible before the following breeding season, and no efforts be made to improve their intrinsic survival abilities. This may, however, require efforts to minimise dispersal through the provision of food which could indirectly increase survival probability

These key recommendations and others pertaining to best practice for restocking methods should be set out in a local or national code of practice and implemented in conjunction with stakeholders.

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APPENDIX 2. A SUMMARY OF CAPTIVE-REARED MALLARD (CRM) RELEASES IN USA

Within North America, there is a persistent dichotomy of purpose behind the ongoing releases of CRMs; to provide quarry for hunting on private shooting preserves, and to supplement the wild population.

1. Shooting preserves

Shooting preserves, as legal and regulated entities, date back to about 1911 (Kouba 1976) and arose as a response to constraining regulations then imposed on the hunting of wild waterfowl (and mallards in particular). CRMs released on shooting preserves could be hunted without constraint on time or quantity, but only within the confines of the preserve. Following the substantial 1970s decline in North American waterfowl populations, and subsequent restrictive hunting regulations, interest in shooting CRMs on shooting preserves increased substantially. A century on from their initial establishment, there are 4631 licensed shooting preserves in USA, most (70%) of which lie within the Atlantic and Mississippi migratory waterfowl flyways (USFWS 2013). Not all preserves release CRMs (most preserves focus on upland game); in 2001 only 317 (7%) reported doing so, and collectively they released 273,000 birds (USFWS 2013). However, some preserves run large-scale breeding and release programmes e.g. one in Maryland released 37,000 to 122,000 mallards per year between 1981 and 1993, totalling 1.1 million birds (USFWS 2013). In New York State, 85,000 CRMs were released in 2005 (Osborne *et al.* 2010). It continues to be a means by which urban-based hunters can enjoy the recreational pursuit of their forefathers, and it is big business (e.g. see <http://orapax.com/duck-hunting/>).

Traditionally, shooting preserves released their flighted mallards from towers. This release method consists of holding birds in pens until their release from high towers and their flight directed towards waiting hunters. The hunters are positioned on a flight path towards a pond with which the birds are familiar, and released birds not shot but which land in the pond, are trapped and taken back to pens or, if they are trained to do so, return to the pens by themselves. This method of release is cost-effective, since most birds are either shot immediately upon release or the survivors are later gathered up and contained for a subsequent release. An estimated 70% of the CRMs are shot immediately on their release (USFWS 2013). This "put-and-take" method prevents the CRMs intermingling freely with wild ducks, and ensures few escape to the wild.

However, a liberal interpretation of USFWS regulations saw shooting preserves adopt another release method whereby greater numbers of free-flying CRM mallards were released and the birds "trained" to move freely among several impoundments on the preserve that serve as feeding and loafing areas. Once they are released, the birds are not trapped or put back into captivity, but instead visit flooded grain crops and other feeding sites which the preserves provide. In this way the ducks remain on, or near to, the preserve. While hunters derive a more "wild" hunting experience, fewer of the CRMs are shot (approx. 40%; USFWS 2013) and a greater number escape to mingle with the wild population.

This latter free-flying release method is now the most popular e.g. 80% of 160 preserves on the Atlantic flyway that reported their release methodology in 2001, used this technique (USFWS 2013). Its attraction is because breeding costs are minimised; the birds can be removed from pens even before fully fledged, and can be released when ready rather than held awaiting the shooting season.

The free-flying release method has caused great angst. Wild birds are drawn to the many fed ponds and crops where the CRMs also act as decoys. Thus, wild birds are shot on these preserves in defiance of seasonal and bag restrictions that apply to wild duck hunting but which don't apply to CRM hunting on preserves. Regulatory responses that attempt to restrict shooting preserve activities

to the same dates as State-wide wild duck hunting are a constant source of friction, and a law-enforcement nightmare (USFWS 2013).

The intermingling of CRMs and wild birds has raised genetic and disease transmission concerns. However, these are more associated with the widespread releases of CRMs for population supplementation than being a consequence of shooting preserve survivors. The arrival of duck virus enteritis from Europe to North America via domestic ducks and its eventual spread into the wild population (summarised in USFWS 2013:36) emphasised the potential for farmed ducks to become a source of infection for wild waterfowl. However, this is a rare example from USA of disease transfer from captive to wild birds. Other serious disease outbreaks affecting wild waterfowl in North America e.g. botulism, avian cholera, have all manifest in wild habitats (especially crowded waterfowl refuges) and none was knowingly precipitated by disease transfer from captive collections or breeding facilities (Baldassarre & Bolen 2006).

2. Population supplementation

In the past 100 years, North America has experienced two substantial "crashes" in duck populations; in the dust bowl era of the 1930s, and the 1970s. Both had their origins in rapacious land utilisation, and drought (Baldassare & Bolen 2006), especially in the pothole prairie region of central southern Canada and north-central USA where 50-80% of the continent's game ducks are produced. The former crash prompted private and State-sponsored breeding and release programmes, especially for mallard, and the latter crash promoted further State breeding initiatives, and the eventual continent-wide North American Waterfowl Management Plan (see <https://www.fws.gov/birds/management/bird-management-plans/north-american-waterfowl-management-plan.php>)

From the get-go, there was debate about the utility of releasing CRMs into the wild (e.g. Benson 1939). Early releases were derived from game farm stock and it was soon apparent they struggled to survive. Focus shifted to "wild strain" mallards (i.e. those generally no more than two generations removed from the wild) and the results were equally discouraging. An early evaluation by Brackhage (1953), who compared over 6000 wild mallards with a similar number of wild-strain hand-reared birds (i.e. birds reared from eggs taken directly from the wild) showed that the CRMs migrated and then returned to breeding areas just like wild birds. However, they were so much more vulnerable to hunting mortality that Brackhage concluded "the release of ducks hand-reared from wild eggs cannot be recommended as a practical management technique". Another study (Hickey 1952) showed it was not until the third year that the effects of captivity wore off and mortality rates became akin to truly wild birds, but by then merely 5% of releases were still alive. As further studies demonstrated similar results (summarised in Batt *et al.* 1990; see Appendix 5), forums like the 1971 McGraw symposium on *The role of hand-reared ducks in waterfowl management* (see references) were convened to explore every possible avenue to improve this management approach. Despite the science all pointing in the direction of futility (without additional habitat management), some State agencies persisted (e.g. in Maryland, >300,000 were bred and released between 1974 and 1988 with another 240,000 released by private sources; Heusmann 1991).

Batt *et al.* (1990) in their substantive review of all studies, declared "hand-reared birds have been shown in every recruitment and survival parameter measured, to be inferior to wild birds. Thus, we see little evidence that use of hand-reared birds has much hope to reverse the decline of North American mallards, especially where even natural populations cannot sustain their levels".

In the conclusions of their review Batt *et al.* (1990) added:

"The use of hand-reared wild strain mallards to restore breeding populations is not supported by the published literature. Studies have demonstrated inferior survival and reproductive capabilities of such birds released into the same environment that

is incapable of retaining wild populations. Clearly the factors that caused these declines will even more relentlessly decimate the hand-reared stock. Wild mallards have demonstrated considerable flexibility in responding to changing habitat quality on continental, regional and local scales. Numerous case histories indicate that wild birds rapidly can discover and exploit improved habitat and that the recovery of wild populations is limited by habitat quality, not the availability of breeding stock..... Mallard populations have a tremendous capacity for growth when reproductive success is improved and can rapidly pioneer new habitats as they become available. The basic tenets of the North American Waterfowl Management Plan recognise this by focussing expenditures on programs that improve rates of recruitment, largely by raising nest success, rather than expending funds on efforts to add hand-reared birds to an already troubled population.”

From numerous field studies, and from modelling exercises (see Batt *et al.* 1990), the message is overwhelmingly clear. Without investment in habitat improvement and expansion, no increase in population size can result from CRM releases, no matter for how long or in what numbers they are conducted.

There are still studies being published that demonstrate differential survival and productivity of CRMs and wild mallards (e.g. Smith 2000; Smith & Rohwer 1997; Yerkes & Bluhm 1998; Osborne *et al.* 2010) and positive responses of ducks to habitat (especially predator) management (e.g. Beauchamp *et al.* 1996; Sovada *et al.* 2000). In the pages of the Journal of Wildlife Management, the point is being well belaboured.

Postscript

Research for this paper unearthed Kouba (1976) *The evolution of shooting preserves in the United States* that I found compelling reading, for it identified factors considered responsible for the modern expansion of private hunting preserves in USA. I was struck by the resonance of some factors to the present circumstances in NZ. This article, difficult to access other than through a university library, is appended as Appendix 4. Similarly, the paper by Batt & Nelson (1990) which is a succinct evaluation of evidence about the efficacy of supplementing wild mallard populations with hand-reared birds, is appended as Appendix 5.

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<https://www.fws.gov/migratorybirds/pdf/surveys-and-data/Captive-rearedMallardReport.pdf>

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APPENDIX 3: PERSPECTIVES FROM THE UNITED KINGDOM

I have been unable to source helpful information about the nature and extent of captive-reared mallard releases in UK. Below are responses from 2 UK biologists to my inquiries about 1. the scale of releases, 2. whether released birds are screened for pathogens, and 3. whether there are observed biological consequences arising from the releases.

1. From Dr Carl Mitchell, Wildfowl and Wetlands Trust.

I'm afraid that supplementing wild Mallard stock in the UK is very poorly managed, and there are very few data on the number of releases. What little information that exists (as far as I am aware) goes back nearly 40 years.

As you know, early studies indicated that survival following release was poor and 90% of released birds were recovered within a few km of the release point. The mortality of juveniles in the first 12 months was 94% compared with 70% wild juveniles [1]. Following this study there was a WAGBI (now BASC) policy of releasing Mallard in areas where they would not be shot in their first year, although I don't know if this continues.

Myrfyn Owen mentions that more than 15,000 birds were being released by WAGBI in the 1960s and 1970s [2] although this formed only a small proportion of all mallard releases in Britain, most of which are put out on flight ponds by private estates and individuals on a 'put and take basis' with 75% or more of those released birds being shot from the pond in the autumn of releases.

As far as I am aware, there are no data on the data actually being released, but it was estimated at ~400,000 *per annum* in the late 1970s/early 1980s [3]. This was at a time when the estimated winter population (from wildfowl counts) was 500,000 birds. It's impossible to tell what would happen to the truly wild Mallard population if the releases stop (presumably shooting pressure would increase on the wild stock).

You might consider contacting BASC now to see if there are any updated figures. As I say, I'm a little out of touch with this. John (Harradine) has retired now, but a useful contact might be Matt Ellis (matt.ellis@basc.org.uk)

[1] Boyd, H. (1956). The use of had reared duck for supplementing wild populations. Wildfowl Trust Ann Report 8:91-94.

[2] Owen, M., Atkinson-Willes, G.L. & Salmon, D.G. (1986) Wildfowl in Great Britain – 2nd Ed. The University Press, Cambridge

[3] Harradine, J. (1982). Sport Shooting in the United Kingdom – some facts and figures. Proc. 2nd Mtng IUGB Working Group on game Statistics, Netherlands 1982

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2. From Dr Matt Ellis, British Association for Shooting and Conservation

We don't currently know how many mallard are released in the UK, but we know that around 1 million ducks are harvested each year in the UK:

See table 27 here: <http://www.shootingfacts.co.uk/pdf/consultancyreport.PDF>

[Table 27: Estimates of the number of gamebirds and wildfowl shot in UK 2012/13: Pheasant 13,000,000 Partridge 4,400,000 Grouse 700,000 **Duck 1,000,000** Goose 110,000 Woodcock 160,000 Snipe & other waders 110,000 Total Gamebirds 20,000,000]

A number of these will be wild migratory ducks, but other evidence sources suggest that these are only likely to account for around 10,000 birds. This means that the majority of the 1 million ducks shot each year are mallard, and the vast majority of those will have been released on inland ponds. Given natural losses and an annual unharvested surplus you can safely say that at least 1 million mallard are released each year in the UK, with similar numbers released in a number of other European countries.

There are significant biological risks to releasing farmed mallard, both in terms of spread of disease, but also hybridisation with truly wild birds. Mallard have been in slow, but long-term decline across Western Europe for around 25 years. The reasons for this aren't clear, but breeding productivity does seem to have declined and could well be because of in-breeding with farmed stock. There is also evidence of morphological changes:

<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0115143>

In terms of financial returns, you can see how much people are charging for a day's duck shooting here: <https://www.gunsonpegs.com/shooting/duck-shooting>

The average price paid to shoot a duck is still around £26/bird (this was from 2013, but the cost hasn't changed much). This is less expensive than pheasant and partridge shooting (generally over £30/bird) and is usually included as a single drive as part of a day's pheasant shooting, although the link above shows some shoots are now specialising.

<http://19e21141e53b5c034df6->

<fe3f5161196526a8a7b5af72d4961ee5.r45.cf3.rackcdn.com/7914/4793/4818/the-shooting-fishing-census-2013.pdf>

Generally released UK birds are from long-held captive stock, but rearers are beginning to get new strains: <https://www.hy-fly.co.uk/game-birds-c1fme>

My personal feeling is that it's a bad idea, especially where there is a risk of hybridisation with wild mallard, or other species. Unfortunately though economics have taken over in the UK and I can't see there being any appetite to reduce the numbers released. There is also some evidence that actually because the released mallard are such poor breeders, and because they so massively outnumber the wild mallard that they act to dilute the hunting pressure on the wild population and are unlikely to interbreed with it, so the benefits may well outweigh the costs:

<http://www.ornisfennica.org/pdf/latest/161Champagnon.pdf>

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THE EVOLUTION OF SHOOTING PRESERVES IN THE UNITED STATES

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HUNTING has been a traditional form of outdoor activity in the United States since colonial times. As the nation's population has expanded, the number of hunters has also increased. In 1950 some 12.6 million hunting licenses were sold. License sales reached 18.4 million during 1960, and by 1972 there were over 22 million licensed hunters in the United States (1).

Despite the increased number of hunters, one prerequisite for hunting, availability of land, has not kept pace and has actually decreased as a result of the posting of land against hunting, the leasing of hunting rights to sportsmen, and changes in land use that preclude or inhibit hunting. Furthermore, a disparity exists between centers of population and the location of 342 million acres of public lands open to hunting in the contiguous 48 states (2). In response to this situation a form of recreational land use has emerged in the United States that may portend hunting of the future, especially near large urban centers—the controlled shooting preserve.

SHOOTING PRESERVES DEFINED. A shooting preserve is a private enterprise in game management which the National Shooting Sports Foundation defines as a privately owned and operated area on which pen-reared game is released for hunting, usually upon payment of a fee by shooters. The term "shooting preserve" implies in most instances that there is an extended season longer than the regular state-wide season, that there is no bag limit on released game, and that the area is licensed or sanctioned by the state game commission (3).

Several distinct types of preserves have developed in most states and may be categorized as follows (4):

- A. Commercial shooting preserves operated for profit.
1. Fee-hunting operations: open to the public on the payment of a daily fee for hunting or for the number of birds shot.
2. Subscribing-member operations: re-

stricted to a definite number of hunters who pay a prescribed membership fee, usually in advance and on an annual basis.

3. Subscribing member-daily fees: open to the public on the payment of a daily fee or for the number of birds shot, besides retaining a number of subscribing members.

B. Private shooting preserves not operated for profit and not open to the general public.

1. Clubs: operated and either owned or leased by a group of hunters who perform their own labor or utilize hired help.
2. Cooperatives: usually composed of farmer members who provide the land, and city members who provide the funds.
3. One-owner (or lessee) preserves: area licensed to and managed by an individual who may hunt alone or with nonpaying guests.

Shooting preserves, regardless of location, operate in essentially the same manner. Pen-reared game birds, principally the ringneck pheasant, but also Bobwhite quail, mallard ducks and chukar partridge, are released for hunters to shoot. At commercial preserves, hunters may pay an established fee, so much per bird, or combination of both. On private preserves, expenses are absorbed in a manner contingent upon the type of operation. The ultimate purpose of shooting preserves is to provide hunting opportunities (with "guaranteed" success) for a period of time in excess of state-wide hunting seasons.

Basic legislation governing shooting preserves is also similar throughout the country. A potential operator need only apply for a license from the state game department, post his land adequately, release only pen-reared game, and abide by any additional restrictions imposed by his state, e.g., mandatory acreage requirements.

ORIGIN OF SHOOTING PRESERVES. King Henry VIII of England coined the term

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"shooting preserve" in a 1536 decree that closed an area in what is now metropolitan London to the hunting of pheasants, herons and partridges (5). It is not clear whether this was a small shooting park for his own use or a minor game refuge. Using the above definition of shooting preserves, the historical antecedents of the modern shooting preserve can be traced back to the English colonies in America.

The early history of New York reveals that there were two groups of hunters whose attitudes toward game were diametrically opposed (6). One, the market hunter, was busy supplying the demands of hotels and commission houses. The other group, comprised of sportsmen, was interested in conserving game for the sport of hunting. Both favored long open seasons and unlimited bags as long as they could be penetrated. The sportsmen, however, realized that game supplies were not unlimited and joined forces at an early date. Some, who had the means, individually or collectively bought or leased large tracts of land, reserving to themselves exclusive hunting rights. Here they propagated game, including deer and pheasants, and regulated shooting. Trained game keepers were imported from Europe to handle the controlled breeding of the game and to manage the lands. In this manner the first shooting preserves in America came into being, organized even before there was an apparent need for regulatory state laws, and long before the first state game commission was established.

On August 14, 1705, the first game law became effective in New York (7). This law prohibited the killing of deer except between August 1 and January 1. The first closure for a term of years was placed on Massachusetts deer in 1718 (8). In 1780 a statute provided for a closed season on ruffed grouse on Long Island (9). These were the first closed seasons on game animals in America. A hunting license was first required by New York in 1864 (10). In 1892 the so-called "posting law" was passed to prohibit trespassing on tracts of land where game was propagated and managed. Such areas were designated as "private parks" (11). It was from this beginning that the general posting of lands

Of paramount importance to the legalization of shooting preserves was the Bayne Bill, introduced to the New York State Legislature in 1911, "to prohibit the sale of all game birds belonging to the same family as protected species found in the state, regardless whether they had been killed in this country or abroad" (12). The Bayne Bill was later amended to permit the sale of European grouse, Blackcock, plover, partridge, and various deer imported from abroad. A rider tacked to the bill permitted sale of pheasants, mallards and black ducks which were raised on game farms. The Bayne Bill became a law on June 16, 1911, and New York became the first state to legalize shooting preserves.

DIFFUSION OF SHOOTING PRESERVES. Despite this early start, the acceptance of the shooting preserve concept developed slowly throughout the United States. Wild game was relatively abundant, and a large portion of the population resided in rural areas. Hunters, as a whole, were slow to endorse the shooting preserve. They were suspicious of the concept and generally opposed legislation permitting the operation of preserves. There was some apprehension among sportsmen that shooting preserves represented a return to the "European system" of private game preserves (13). As the nation grew and metropolitan areas expanded, however, the concept became more acceptable. The first states after New York to pass enabling legislation for shooting preserves were Michigan (1929), Wisconsin (1931), New Jersey (1932), Connecticut (1933), New Hampshire (1935), Virginia (1936), Pennsylvania (1937) and California and Illinois (1939).

In 1955 the first national survey of shooting preserves was undertaken (14). At that time there were only 22 states with enabling legislation for shooting preserves and each of these states had at least one preserve. These states were largely in the eastern portion of the country with the exception of California, Nevada and Arizona (Table 1). Of the 756 preserves in existence, approximately one third (258) were in New York. Other states with large numbers of preserves were New Jersey (115), Pennsylvania (80), Wisconsin (79), California (73) and Illinois (70). These six

TABLE I
NUMBER OF SHOOTING PRESERVES IN THE UNITED STATES, SELECTED YEARS

State	1954-55	1957-58	1960-61	1963-64	1967-68	1970-71	1972-73
Alabama	—	2	4	6	12	No data	17
Alaska	—	—	—	—	—	—	—
Arizona	2	1	4	1	4	3	5
Arkansas	1	3	9	17	14	29	22
California	73	121	154	189	202	205	212
Colorado	—	—	2	2	10	14	18
Connecticut	—	—	—	—	26	23	24
Delaware	21	26	26	29	26	23	24
Florida	1	3	1	3	3	4	3
Georgia	2	4	44	80	93	80	79
Hawaii	1	10	36	40	41	42	41
Idaho	—	—	1	—	—	—	—
Illinois	70	110	119	132	149	167	167
Indiana	—	6	14	28	31	40	41
Iowa	—	9	9	10	10	12	10
Kansas	—	15	15	19	26	27	29
Kentucky	—	11	10	14	11	14	22
Louisiana	1	2	4	6	7	3	3
Maine	—	—	—	—	—	—	1
Maryland	9	14	31	32	38	36	38
Massachusetts	—	—	—	8	10	9	9
Michigan	—	3	42	59	63	75	77
Minnesota	—	7	11	11	17	30	30
Mississippi	4	4	4	19	34	55	54
Missouri	2	4	19	35	36	42	49
Montana	9	10	—	—	—	4	2
Nebraska	—	2	1	—	1	2	4
Nevada	3	4	1	8	9	10	7
New Hampshire	—	1	4	—	2	3	3
New Jersey	115	124	173	229	322	305	315
New Mexico	—	—	2	4	12	15	6
New York	258	335	412	491	534	524	592
North Carolina	—	12	11	11	32	39	41
North Dakota	—	—	—	—	—	—	1
Ohio	16	48	60	61	49	45	50
Oklahoma	1	2	2	2	—	5	3
Oregon	—	—	—	—	—	1	3
Pennsylvania	80	134	172	190	199	212	208
Rhode Island	7	6	6	8	7	7	8
South Carolina	—	1	13	24	35	30	37
South Dakota	—	—	—	—	—	—	—
Tennessee	1	2	12	36	60	48	46
Texas	—	35	45	82	94	91	94
Utah	—	—	—	2	4	16	17
Vermont	—	—	—	2	2	1	2
Virginia	—	28	—	46	63	57	55
Washington	—	5	6	8	8	8	11
West Virginia	—	2	3	8	8	5	7
Wisconsin	79	103	134	177	176	179	197
Wyoming	—	—	—	—	15	15	19
Total	756	1,207	1,663	2,119	2,471	2,534	2,681

Source: E. I. Kozlasky, "Shooting Preserve Survey" (1955, 58, 61, 64); author surveys (1969, 71, 73).

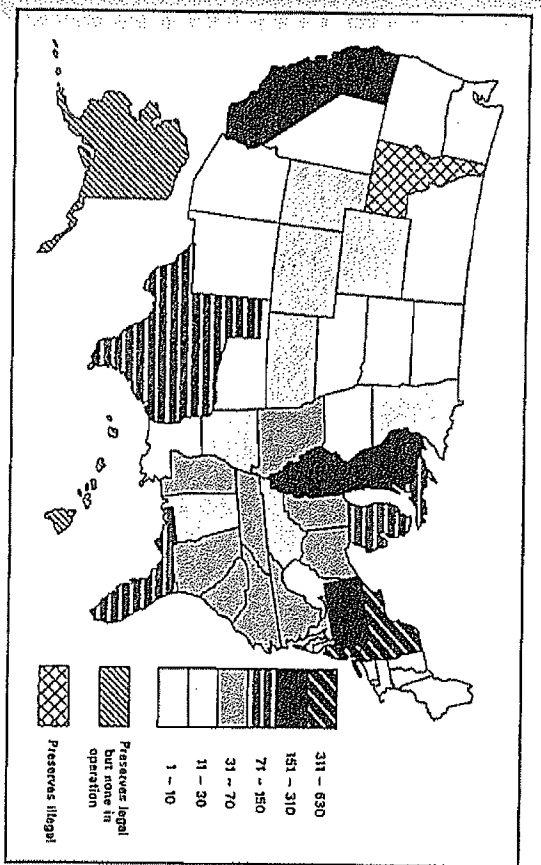


Figure 1. Shooting preserves in the United States, 1973.

states, which were among the first to legalize preserves, accounted for 675 or 89 percent of all preserves in the country. Of the 756 preserves, 136 were open to the public and 620 were listed as private.

Forty-one states had legalized preserves by the end of the 1960-1961 shooting preserve season and at least one preserve was in operation in each of these states (15).

Of the 1,663 preserves in operation, 449 were listed as public and 1,214 as private. The nine states without enabling legislation included Alaska and a contiguous block in the northwestern part of the country—North and South Dakota, Montana, Idaho and Wyoming. In the Northeast, Maine, Vermont and Massachusetts remained without preserves.

During the 1967-1968 season, shooting preserves were illegal in only three states: Alaska, Idaho and Montana. Preserves were actually operating in 43 states, and a total of 2,471 were recorded (16).

By 1973 a total of 2,681 shooting preserves existed in the United States (17). Only Idaho had not yet legalized preserves (Figure 1). The states of New York, New Jersey, California, Pennsylvania, Wisconsin and Illinois remained dominant in numbers

of preserves, containing 1,691 or 63 percent of the country's total. Of the 2,107 preserves identified by game departments as either commercial or private, approximately 75 percent were classified as private enterprises.

The expansion of shooting preserves throughout the United States is attributable to several factors:

- (1) Increasing number of persons with more leisure time and money to expend in recreational hunting.
- (2) Growing proportion of urban dwellers lacking contacts in rural areas for hunting privileges.
- (3) Paucity of public hunting grounds, especially near large population centers.
- (4) Continued transformation of land bordering metropolitan areas to forms of land use incompatible with hunting.
- (5) Increased posting of private land against hunting.
- (6) Guaranteed encounters with game on each excursion to a shooting preserve.
- (7) Implementation of reduced bag limits by game agencies in an at-

- tempt to fit the harvest to the game supply.
- (8) Improvements in propagation methods which permit game birds to be produced at lower costs.
 - (9) Acceptance of or at least indifference toward the shooting preserve concept on the part of the public as well as sportsmen.

CONCLUDING REMARKS. Shooting preserves have steadily grown in number and areal extent since the state of New York first legalized such operations in 1911. By 1973, a total of 2,681 preserves existed in the United States, and only Idaho had not yet passed enabling legislation. The majority of preserves (65 percent) were concentrated in the states of New York, New Jersey, California, Pennsylvania, Wisconsin and Illinois, all early proponents of the shooting preserve concept.

The growth trend should continue since the availability of hunting lands open to the general public, especially near large

population centers, has not kept pace with the increase in numbers of hunters and has in fact diminished. Shooting preserves should continue to provide hunting opportunities primarily for urban hunters who can be categorized under one or more of the following: (1) lack contacts in rural areas for hunting grounds, (2) are more affluent, (3) have greater leisure time, (4) are reluctant to travel long distances to public hunting areas with no assurance of encountering game, and (5) wish to extend their hunting season beyond the regular state-wide season.

One can only speculate about the short-term effects of the recent economic recession on shooting preserves. It is likely that relatively expensive leisure activities such as recreational fee hunting will have fewer participants. If a decrease in shooting preserve operations occurs, however, it is believed that the cutback will be of minor significance in relation to the long-term trend.

- (1) U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States, 1974* (Washington: U.S. Government Printing Office, 1974), p. 208.
- (2) Outdoor Recreation Resources Review Commission, *Outdoor Recreation for America* (Washington: U.S. Government Printing Office, 1962), p. 72.
- (3) C. Dickey, *Shooting Preserve Management* (New York: Sportsmen's Service Bureau, August, 1960), p. 1.
- (4) G. V. Burger, *Licensed Shooting Preserves in Wisconsin*, Technical Bulletin No. 24 (Madison: Wisconsin Conservation Department, 1962), p. 4.
- (5) E. L. Kozicky and J. Madison, *Shooting Preserve Management—The Niles System* (East Alton, Ill.: The Winchester Western Press, 1966), p. 19.
- (6) E. R. Holm, "What About Shooting Preserves?" *The New York State Conservationist* (December-January, 1958-1959), p. 3.
- (7) *Ibid.*
- (8) A. Leopold, *Game Management* (New York: Charles Scribner's Sons, 1933), p. 13.
- (9) Holm, *op. cit.*, p. 3.
- (10) Leopold, *op. cit.*, p. 13.
- (11) Holm, *op. cit.*, p. 3.
- (12) *Ibid.*
- (13) Kozicky, *op. cit.* (1967), p. 20.
- (14) E. L. Kozicky, "Shooting Preserve Survey," (East Alton, Ill.: Olin Mathieson Chemical Corporation, Conservation Department, Summer, 1955).
- (15) E. L. Kozicky, "Shooting Preserve Survey," (East Alton, Ill.: Olin Mathieson Chemical Corporation, Conservation Department, Summer, 1961).
- (16) L. J. Kouba, "A Geographic Analysis of the Spatial Variation of Hunter Activity on Controlled Shooting Preserves in Illinois," unpublished PhD dissertation, Boston University, 1970, p. 18.
- (17) Questionnaire mailed to each State Game Department in the United States (Fall, 1973).

The Role of Hand-reared Mallards in Breeding Waterfowl Conservation

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Introduction

Waterfowl breeding in the mid-continent region of North America have undergone severe population declines during the last decade (U.S. Fish and Wildlife Service and Canadian Wildlife Service, 1989). A combination of drought and intensified land use is largely responsible for these declines (Nelson 1989). The overall duck population has also hovered near record lows since 1985.

This situation has led to unprecedented actions by private citizens and public officials to design and implement new programs to reverse the decline. Among the most notable of these is the North American Waterfowl Management Plan (NAWMP) which was signed by the governments of Canada and the U.S. in May 1986 (U.S. Fish and Wildlife Service and Canadian Wildlife Service 1986). Since 1987, the proceedings of the North American Wildlife and Natural Resources Conference have heralded progress in implementing this ambitious plan. The most promising recent step by the U.S. government has been the signing of the North American Wetlands Conservation Act (S-804) by President George Bush on 13 December 1989, assuring significant financial support for implementation of the NAWMP across North America.

As with any threatened public resource, professionals and private citizens have responsibility to explore every avenue that might be of some positive and practical benefit in providing a brighter future for waterfowl. Among possibilities is the use of hand-reared mallards (*Anas platyrhynchos*) to enhance the size of breeding populations. This same possibility was seriously considered and studied during the last major decline of populations in the early 1960s. Burger (1975:106) noted that although waterfowl propagation has been viewed by most professionals as "a peripheral tool in waterfowl management the emphasis we humans place on peripheral solutions varies with the degree of the problem."

Our purpose in this paper is to analyze the information available on the use of hand-reared mallards in breeding population management and to evaluate the potentials of this practice in the context of modern-day waterfowl and wetland conservation. We examine the potential for assisting, with hand-reared mallards, remnant wild populations in a recovery, given that habitat programs envisioned in the NAWMP are implemented successfully. Given the widespread support for the NAWMP, among politicians, professionals and the general public, we assume the need for quality habitat is understood and paramount. Can mallard populations recover, simply in response to improved habitat conditions, or do they require some assistance, via hand-reared bird releases, to re-establish their original distributions and abundance?

Our focus will be on the use of "pure" wild-strain mallards (less than two generations removed from the wild) because it has long been understood that semi-domestic and game farm mallards have little potential for restoring breeding populations due to their low survival in the wild (e.g., Bednarik and Hansen 1965, Bailey 1979, Burger 1984). Our analysis also specifically and intentionally excludes consideration of information related to the value of birds raised and released locally in efforts to enhance nearby hunting opportunities.

Previous Studies

Most research on the potential of releasing hand-reared birds to enhance waterfowl management programs have used game farm or semi-domestic mallards (e.g., Bednarik and Hansen 1965, Burger 1975). However, several aspects of survival and breeding success of released wild-strain mallards were studied in Manitoba by Brakhage (1953), Sellers (1973), Bailey (1979), Gatti (1981) and, in North Dakota, by Lee and Kruse (1973).

Brakhage (1953) compared patterns of migration and mortality between 6,623 hand-reared birds [including mallards, pintails (*Anas acuta*), redheads (*Aythya americana*), and canvasbacks (*Aythya valisineria*)] and 6,284 wild-trapped birds of the same four species over a 21-year period (1932-51) on the Delta Marsh, Manitoba. Hand-reared and wild-trapped mallards comprised 2,007 and 2,930 individuals, respectively. These comparisons were not well controlled as there was considerable variation in release techniques, age at release, numbers released each year and sex and age of birds banded each year. Nevertheless, the results provided the first indication that hand-reared birds of wild genetic stock migrated in a similar pattern to wild-trapped waterfowl and had a similar tendency to home back to the area from which they were released.

However, hand-reared birds were dramatically more vulnerable to hunting mortality, resulting in few birds returning the following spring to breed. Based on his analyses, Brakhage (1953:476) concluded that "the release of ducks hand-reared from wild eggs cannot be recommended as a practical management technique."

Sellers (1973) reported on the largest, best controlled and most intensively studied release of hand-reared wild mallards. In 1969 and 1970, 1,474 female ducklings between four and five weeks of age were released in a 4-square-mile (10.36/km²) study area in the Canadian prairie pothole region near Minnedosa, Manitoba. This represented a minimum of 15 times more mallard ducklings than could have been produced by the mallard pair population originally present on the study area during the same years (Sellers' data: 16 pairs per square mile (6.18/km²), 20 percent nest success and fledged brood size of 6.7 with a 50:50 sex ratio). Sellers estimated the return of released birds to the study area to be between 20 and 25 percent.

The release area mallard breeding population was elevated to 50 and 66 pairs per square mile (19.3 and 24.5/km²) in 1970 and 71, respectively. During the two years following release, the proportion of all mallards in the experimental area producing broods was only between 9 and 12 percent despite better than average habitat conditions for breeding waterfowl. Thus, while Sellers confirmed the ability of wild stock mallards to migrate and return to areas from which they were released, serious doubt was cast on the ability of such birds to reproduce and sustain themselves once their populations had been artificially elevated.

Sellers (1973) concluded the decline of the mallard breeding population from 36 pairs per square mile ($13.9/\text{km}^2$) in 1952 (Dzubin 1955) to 16 ($6.18/\text{km}^2$) in 1969 and 1970 was a result of low nesting success which, in turn, indicated excessive predation. It was evident that if nesting success was not improved, populations in the release area would quickly return to the original densities more characteristic of the region. This was indeed the case. MacFarlane (1977), working on the release area in a subsequent study, estimated the mallard population had declined to 14.4 pairs per square mile ($5.2/\text{km}^2$) by 1974, less than 25 percent of the number recorded three years earlier even though, during the six-year interval of those two studies, hunting also had been excluded.

Bailey (1979) followed Sellers with releases, in 1970 and 1971, of 1,204 female and 214 male hand-reared wild stock mallards on the Delta Marsh. He proposed to test if breeding populations could be elevated on large marsh habitat. He observed high pre-fledging mortality. However, for those birds surviving, he observed homing rates of 26–28 percent by yearlings and 53 percent by two-year olds. On two study areas over the two years of analysis, Bailey (1979) estimated that only, 0, 0, 10.5, and 14.8 percent of the hand-reared mallards produced broods. He also observed considerable year-to-year variation in the size of the native population using the Delta Marsh area because of movements to and from other areas on the breeding grounds. Bailey (1979:61) concluded that "In view of the poor reproductive success of hand-reared birds and the apparently high potential for natural immigration and production, mallard stocking is of questionable value on the Delta Marsh."

The emphasis of hand-reared mallard studies next switched to developing release techniques designed to increase survival of young to fledging and through the post-fledging period (Lee and Kruse 1973, Gatti 1981). Both of these studies showed that survival could be markedly improved by using a technique known as "gentle release." Neither study presented data on the comparative reproductive success of wild and hand-reared birds during subsequent years.

Interestingly, Lee and Kruse (1973) observed a 79-percent increase in breeding pairs and a 93-percent increase of young produced on their study area during the year immediately following release. They cautioned these increases were only partly the result of the releases, as habitat management on the study area had improved conditions. Nevertheless, one year later the population decreased by 47 percent and numbers of young produced decreased by 58 percent, both to lower levels than had been observed prior to the releases. This sudden change was attributed to poor habitat conditions resulting from drought.

These studies have allowed the development of techniques to maximize survival of released mallards, at least to fledging. Data are not available to evaluate survival to the following spring and homing rates compared to wild birds. Where data are available, there is a consistent pattern showing that surviving hand-reared birds experience markedly lower breeding success than their wild counterparts. No studies were discovered that demonstrated an improvement over time in the reproductive success of hand-reared hens. On both the Minnedosa and North Dakota release areas, breeding population improvements were short-lived after being artificially elevated by hand-reared mallard releases.

It is certain that wild and hand-reared mallards are subjected to identical factors affecting reproductive success and survival. Hand-reared birds have been shown, in every recruitment and survival parameter measured, to be inferior to wild birds.

Thus, we see little evidence that use of hand-reared birds has much hope to reverse the decline of North American mallards, especially where even natural populations cannot sustain their levels.

Rationalization for Using Hand-reared Mallards During the 1990s

It is dangerous to conclude that previously established generalizations always, or never, apply to every situation. Thus, to insure this previously discarded practice is not overlooked inappropriately, we have reviewed the potential role of hand-reared birds in rebuilding mallard breeding populations. We constructed the following scenario to guide our assessment.

Mallard numbers are near record low levels in the prairie pothole region where 44 percent of the surveyed population breeds (Batt et al. 1989). Since many species of prairie ducks are known to home back to the area from which they were produced (Sowls 1955), we speculated that, during recent years, there may not have been enough birds available to occupy newly created or improved breeding habitat. When the NAWMP becomes fully implemented, along with the large acreages of retired cropland, there might be vastly more habitat than birds. A lack of birds might be expected to somehow limit the rate of population recovery.

Hand-reared birds could be released into these areas to help "kick start" the recovery of wild mallard populations. Implicit in this scenario is (1) the hypothesis that mallard hens have such strong homing requirements that populations are not able to respond to the availability of improved habitat in areas apart from traditional nesting areas (Hypothesis Ia), and (2) that the rate of population growth can be helped significantly with released birds (Hypothesis Ib).

Second, the Canada goose (*Branta canadensis*) has been successfully reintroduced, using hand-reared birds, into essentially all of its former range in North America (e.g., Cooper 1978, Johnson 1983, Lee et al. 1984) and has been introduced into other parts of the world outside its former range (e.g., Owen 1977). These successes may provide guidance for using hand-reared mallards to bolster existing populations in portions of this species' range. To test this possibility, we examined the hypothesis that mallards and Canada geese are similar enough in the critical aspects of their natural history that introductions and reintroductions of geese are functionally equivalent to adding hand-reared mallards to existing wild populations (Hypothesis II).

Discussion

Hypothesis Ia. If mallards, in fact, have a limited ability to pioneer into new areas, we would not expect to see large annual shifts in populations in response to presence or absence of good breeding habitat. The opposite has been observed ever since systematic surveys have been conducted. These patterns of movement into and out of the prairies in response to habitat quality has, perhaps most eloquently, been characterized in the writings of Lynch (1984).

Johnson and Grier (1988) conducted a comprehensive analysis of the relationship of mallard breeding population density to the 50 U.S. Fish and Wildlife Service (USFWS) May survey strata (Martin et al. 1979). They concluded that mallards do

have a tendency to home to natal breeding areas, but they also opportunistically settle in improved and newly created habitats. Mallards are known to exhibit flexibility in drought years on the prairies when an increased proportion of the population settles in the northern strata. Clearly populations of mallards are not prevented, on a continental scale, from discovering and shifting into regions where good habitat has been created.

Data from local breeding waterfowl studies on the prairies have also shown consistent positive correlations between numbers of breeding mallards and spring ponds (e.g., Crissey 1969, Dzubin 1969). Krapu et al. (1983) concluded that variation in breeding habitat conditions, modified by previous year's recruitment and known homing rates, accounted for most of the variability observed in breeding densities on specific study sites. Lokemoen et al. (1990) showed that unsuccessful and yearling mallard hens were less likely to return the following year than were successful and older birds, indicating that settling patterns are influenced by breeding success during the previous year. Prairie waterfowl are thus capable of moving between regions of the breeding landscape in response to annual variations in habitat quality and past experience.

To our knowledge, no one has documented a situation where mallard numbers on specific sites were limited by the availability of surviving, locally-produced birds. However, there are numerous case histories of dramatic increases in populations as a result of local improvements in habitat quality that could only be accounted for by rapid pioneering of birds into new habitat.

Duebbert and Lokemoen (1980) demonstrated that dabbling duck nest densities as high as 631/100 ha (2.5 per acre) and nest success rates as high as 96 percent could be achieved in intensively managed nesting habitat in association with a high quality wetland base where mammalian predators had also been removed. Mallard pair densities increased from 23/8.3 km² (7.2 per square mile) in the first year of study to 90, 59, and 137 respectively, for the next three years during which predators were controlled. During these four years, mallard nest success was sustained at high levels, of 79, 99, 95, and 90 percent respectively. They concluded their study illustrated a basic concept of wildlife management regarding the inherent rate of increase that can be accomplished in waterfowl populations when inhibiting factors are removed.

Lokemoen et al. (1987) compared nest density and success between, (1) pairings (five in the first year, seven in year two) of controls to treated peninsulas on which electrical predator barrier fences (Lokemoen et al. 1982) were constructed and mammalian predators were removed and (2) pairings whereby predators were removed from nine islands in North Dakota wetlands one year after two years of baseline nesting data had been collected.

After two years, treated peninsulas had 280 nests, with 60 percent nest success and 1,546 young birds produced. Control peninsulas had only 39 nests of which 8 percent were successful and 29 young ducks were produced. On the islands, 52 nests were found during the two breeding seasons before predators were removed. Nest success was only 8 percent. The year after predators were removed, 851 nests were found of which 87 percent hatched.

Numerous other studies have shown phenomenal concentrations of breeding waterfowl on small patches of habitat where nest success was high (e.g., Duebbert et al. 1983). Clearly, there is strong evidence that waterfowl have great potential to occupy and reproduce in habitat where limiting factors have been removed or reduced.

Hypothesis 1b. Even though mallard breeding populations are currently depressed, in the surveyed areas alone the USFWS estimates populations of about 6.5 million breeding birds. Growth in mallard numbers each year will be predicated on two factors, size of the spring population and rate of increase achieved for that population.

In banking terms, these are analogous to size of the principal and rate of interest. Releasing hand-reared birds into wild populations is an effort to increase the size of the principal, i.e., "kick start" the population. As the studies reviewed indicate, this segment of the population will earn a lower rate of interest because released birds exhibit reproductive and survival rates inferior to wild mallards.

With rates of increase that have been achieved with improvements to habitat quality and a common understanding of the impact of favorable interest rates (i.e., population growth rate) on growth of investments (i.e., mallard numbers), we hypothesized the most cost-effective strategy to increasing mallard populations would be to improve recruitment rates. A simple model was constructed to test this idea. We used an estimate of population change (C) cited by Cowardin and Johnson (1979) as an index of recruitment rate (R). For our purposes, we held S (adult hen annual survival rate) and S_b (yearling hen survival rate from fall to spring) constant in the following formula:

$$C = S + RS_b, \text{ where at zero population growth, } C = 1.0.$$

An initial mallard breeding population of 6.5 million birds was used and the population was allowed to grow over 15 years at some constant rate.

Comparisons were then made between two basic methods of increasing population size. First, population growth rates, as an index to R , were increased to simulate improvements in habitat. Second, the recruitment rate was held constant, and different numbers of birds were released into the population. We assumed that once released birds survived to the following spring, they would survive and reproduce no differently than wild birds. This is an assumption we know to be liberal. Finally, we tried to simulate releases of birds into an improved habitat, comparing results to the scenario where only the habitat was improved.

Small changes in C can produce markedly different patterns of population change (Figure 1). A change in C from 0.95 to 1.05, probably within the range of normal variation, results in a population more than four times larger after 15 years. Thus, a small increase in recruitment rate can dramatically improve population status, even when survival rates are held constant.

When a population is declining ($C = 0.95$ in our example), a substantial number of birds must be released to simply stabilize the population. Assuming 25 percent of the released birds survive to the following spring, nearly 1.4 million mallards would have to be released annually to stabilize the population (Figure 2).

Releasing hand-reared birds into a wild population is expected to have little effect, whether the population is increasing or decreasing. Releasing 100,000 birds annually into a declining population ($C = 0.95$) for 15 years resulted in only 8 percent more birds than if no release had been undertaken, while the population had declined by 47 percent (Figure 2). Conversely, if the same number of birds was released into an increasing population ($C = 1.02$) little added benefit resulted. Releases accounted for only an additional 5 percent gain, but the population had gained 39 percent (Figure 3). Clearly, populations receive little boost by releasing mallards into habitat

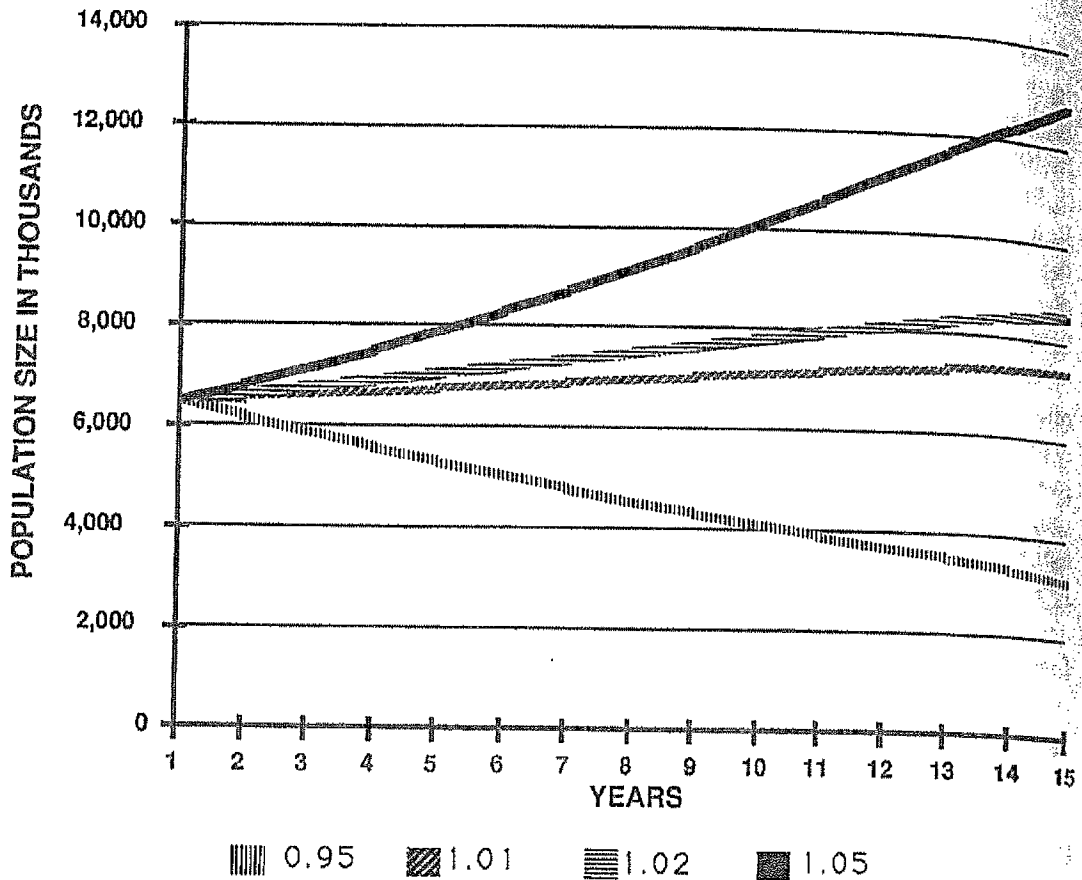


Figure 1. Predicted mallard population changes over 15 years resulting from four potential growth rates ($C = 0.95, 1.01, 1.02$ and 1.05).

where recruitment rates have already been improved. The cost of adding enough hand-reared wild-strain birds to noticeably improve continental populations, even relative to today's low population, would undoubtedly be much higher than taking the approach of habitat improvement in an effort to bolster rates of population growth for existing wild birds.

Hypothesis II. There are significant differences between the natural history traits of Canada geese and mallards, which explain why reintroductions, or establishing new populations of geese, are entirely different than enhancing existing populations of mallards with released birds. Canada goose release programs consist, fundamentally, of placing birds into good habitat where entire populations were extirpated following settlement (Stewart 1975). Because of the more precise homing patterns of geese, new flocks are prevented from discovering these areas to re-establish breeding traditions.

Goose programs are clearly rationalized on the availability of suitability empty habitat. In fact, prairie habitats may be more compatible for geese today than during prehistoric times and the early days of settlement. Today there are few predators large enough to challenge adult geese on nests or when they are tending their young.

Spilled agricultural grains are now readily available throughout the continent as are fertilized crops, lawns and golf courses, all resources which geese readily exploit.

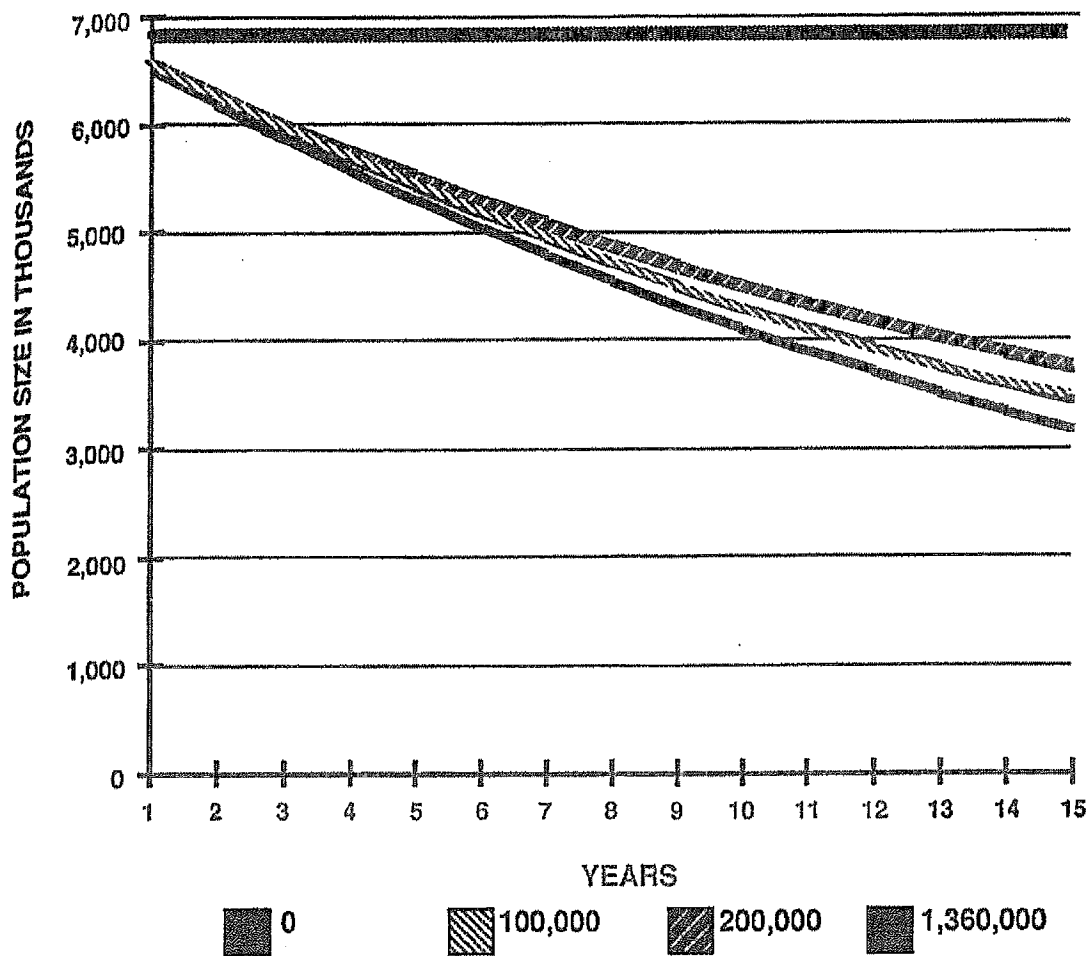


Figure 2. Predicted mallard population changes when growth rate = 0.95 and hand-reared birds are released into the population at three levels (100,000, 200,000 and 1,360,000/year) for 15 years.

Given some protection from hunting during the early years of population establishment, Canada goose populations can explode, and many case histories show that they can quickly become a nuisance.

Releases of mallards into habitats that already have native breeding populations that are below historical levels represent a different situation. Quite plainly, these habitats are underpopulated because mortality is out of balance with recruitment which is currently inadequate to sustain, or allow growth, of populations. It is obvious that, without correcting the problems that caused the habitat to be underpopulated in the first place, little can be gained by releasing inferior, hand-reared birds to supplement wild populations. In terms of banking, if the best investments (wild birds) are earning 0 percent interest, adding more principal (hand-reared birds) with an even poorer return than the original investment would not be an advisable strategy. The more appropriate approach would be to improve the rate of return through investments in habitat. Throughout the prairie pothole breeding range, the great bulk of evidence collected over the last 30 years of research supports the view that recruitment is the single most important limiting factor (e.g., Nelson 1989).

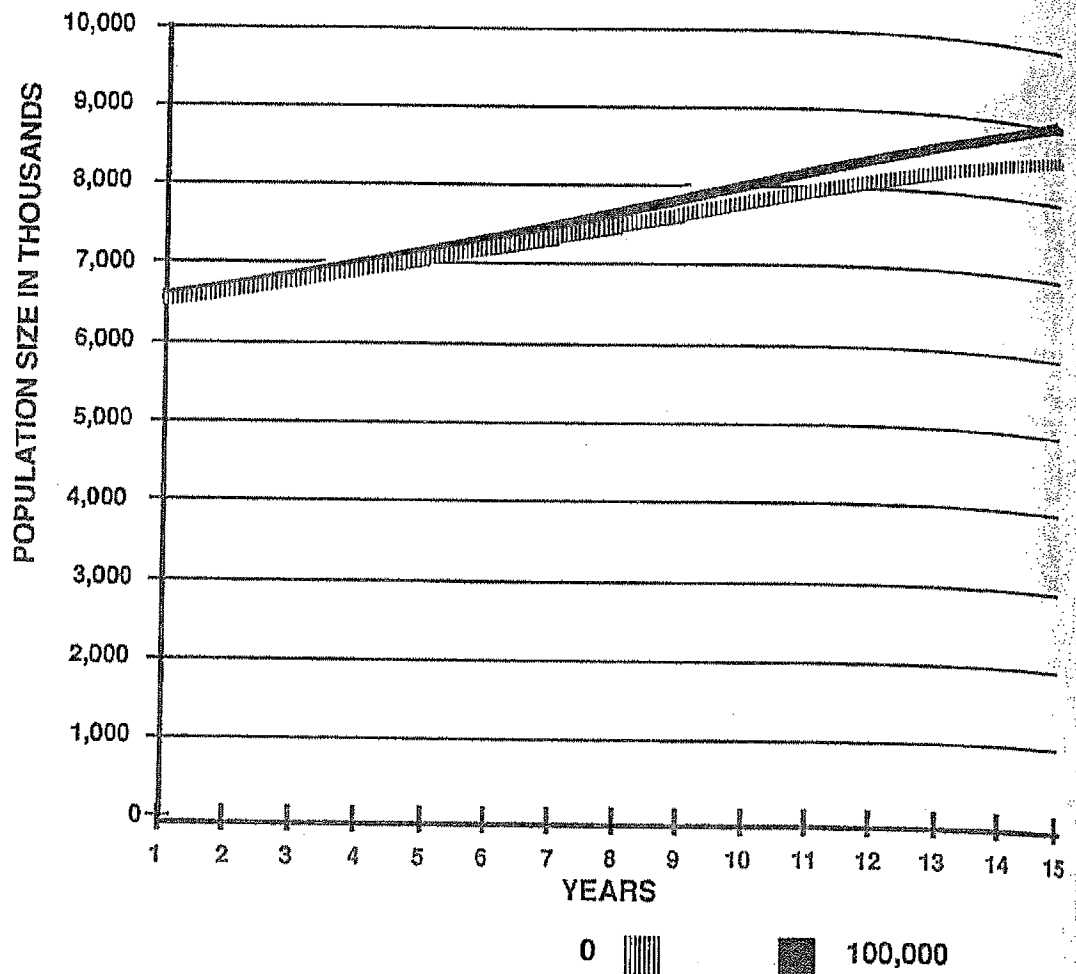


Figure 3. Predicted mallard population changes when growth rate = 1.02 and 100,000 hand-reared birds are released each year for 15 years.

Conclusions

The use of hand-reared wild-strain mallards to restore breeding populations is not supported by the published literature. Studies have demonstrated inferior survival and reproductive capabilities of such birds released into the same environment that is incapable of maintaining wild populations. Clearly, the factors that caused these declines will even more relentlessly decimate the hand-reared stock.

Wild mallards have demonstrated considerable flexibility in responding to changing habitat quality on continental, regional and local areas. Numerous case histories indicate that wild birds rapidly can discover and exploit improved habitat and that the recovery of wild populations is limited by habitat quality, not availability of breeding stock.

Successes enjoyed by previous Canada goose restoration efforts do not rationalize the use of hand-reared mallards to accomplish the same goals because goose programs place birds into good habitat where the basic biology of the species precludes significant pioneering. This is not the case with most prairie breeding ducks, including mallards. Canada goose restoration successes do, however, provide compelling sup-

port for habitat restoration programs that can unleash the reproductive potential of wild birds. Geese have proven how quickly populations can grow when reproductive success and survival are high.

While current conditions in the core of the breeding range have depressed duck populations for an extraordinary period of time, there is no evidence to support the hypothesis that wild populations cannot recover when factors inhibiting recruitment are relaxed. Mallard populations have a tremendous capacity for growth when reproductive success is improved and can rapidly pioneer new habitats as they become available. The basic tenets of the NAWMP recognize this by focusing expenditures on programs that improve rates of recruitment, largely by raising nesting success, rather than expending funds on efforts to add hand-reared birds to an already troubled population.

We offer the further observation that only hand-reared mallards have ever shown any potential in these types of programs. The success of waterfowl conservation will be judged on the recovery on the complete community of ducks and other wildlife that depend on healthy upland and wetland habitats. Hand-reared birds offer little hope of contributing to breeding mallard population conservation and have no potential of contributing to the broader goals of waterfowl and wetlands conservation.

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TARANAKI FISH AND GAME COUNCIL

The Chairman

Taranaki Fish and Game Council

NATIONAL SALMON COMMITTEE

The attached paper was received from NZ Council at short notice. The decline in the wild salmon run is obviously a significant and important issue for some regions though does not impact on us directly. To that end I suggest that Council supports the establishment of a National Salmon Committee with the detail of how it best operates to be resolved by discussion between those affected Councils and National Council.

However in the bigger picture this is not the only major research/ management area that needs to be addressed. Certainly the gamebird and fish committees need to be empowered and meet more regularly also, as may the compliance and RMA groups for example. Therefore it is suggested that as part of setting up the Salmon Committee that this discussion is broadened to address the function and effectiveness of these other national committees also.

RECOMMENDATION

That Taranaki Fish & Game Council;

1. supports the establishment of a National Salmon Committee with the detail of how it best operates to be resolved by discussion between those affected Councils and National Council.
2. asks that this discussion is broadened to address the function and effectiveness of other national committees also.

Glenn Maclean

Regional Manager

30 January 2018

NATIONAL SALMON COMMITTEE

New Zealand Fish and Game Council

Prepared by: Robert Sowman, Policy & Planning Manager

The purpose of this memorandum is to invite consultation and feedback from regional Fish and Game Councils on establishing the terms of reference for a Fish & Game NZ National Salmon Committee.

The attached recommendations have been prepared by Matthew Hall, Central South Island Fish and Game Councillor, appointee to the NZ Council and co-convenor of the Salmon Symposium Steering Committee. These recommendations have been circulated to and approved by the Symposium Steering Committee.

Feedback on the attached is required in time for consideration by the NZ Fish and Game Council at its March 2018 meeting. For this to occur, please provide feedback to the NZ Council Office by Friday 2 March 2018.

New Zealand Fish and Game Salmon Committee.

This is a brief paper prepared for the purposes of establishing terms of reference for a New Zealand Fish and Game Salmon Committee.

At the New Zealand Council Meeting – Friday 24th November 2017 it was resolved

That

The New Zealand Fish and Game Council scope out the formation of a salmon committee and the terms of reference needed to deal with restoring the Sea Run Salmon Fishery here in New Zealand. In achieving these objectives, the council will

- I. Consult with Fish and Game Councils requesting them to recommend their preferred terms of reference.
- II. List out and where appropriate speak to, other stake holders who would form part of the committee.
- III. Give advice on the committee's responsibility to the New Zealand Fish and Game Council and or other Councils.
- IV. In setting up the committee consider the various recommendations that were collated from the workshop at the Salmon Symposium.
- V. Research and advise how a South Island Salmon Management Plan could be integrated into various Species Management Plans so that the recommendations on salmon had status under the Conservation Act and the Resource Management Act. This forming part of the scoping exercise in considering the functions of a Salmon Committee.
- VI. Cost out the running of the committee for a year of operation.
- VII. Report on and make recommendations to the first council meeting in 2018.

Suggested recommendations that would lead to Terms of Reference for a National Salmon Committee

1. The name of the Committee shall be the National Salmon Committee. (Alternative National Sea Run Salmon Committee?)
2. The Committee shall be a committee of the New Zealand Fish and Game Council.
3. The purpose of the committee is to develop a co-ordinated approach within Fish and Game and key stakeholders to ways that will maintain and enhance the sea run salmon fishery in the interest of anglers. (The current crisis facing the salmon fishery drives this purpose.)
4. The New Zealand Council shall approve the terms of reference for the National Salmon Committee after consultation with the regions.
5. To gain the best expertise, advice and advocacy, membership of the committee shall be invited from those organisations that have as part of their objectives the future well-being of the sea run salmon fishery. Individuals dedicated to the salmon fishery or who can provide valuable support may also be invited to join the committee.
6. The committee shall be chaired by a person approved by the New Zealand Council. (An alternative that the chairman shall be a member of the New Zealand Council)
7. The committee shall report to the New Zealand Fish and Game Council and shall be bound the Governance Policies established by the Council.

8. The committee shall be funded from the National Budget.
9. Initially the terms of reference for the committee shall be reviewed annually.

10. The committee shall

- 1) Meet as required, but at least twice a year.
- 2) Meet in Christchurch or at such other location that the committee so decides.
- 3) For membership, draw on the voluntary contribution of governors within Fish and Game who have a special interest in the salmon and staff with expertise in matters relating to the salmon fishery.
- 4) For membership, the committee can call on representation from the wider community and also from groups with a special interest in the sea run salmon fishery. (The objective is not to limit membership; the objective is to add as much value as possible to Fish and Game's efforts in protecting the fishery)
- 5) Assist in the review of the South Island Salmon Management Plan with a view of making better use of its strategic base.
- 6) Advocate the interests of the salmon fishery. (In the widest possible sense)
- 7) Recognise the autonomy Regional Fish and Game Councils have and their statutory function to manage salmon. The purpose of the National Salmon Committee is, to where possible, support and enhance the work of the regions.
- 8) Seek the support of government and other statutory entities and the ways they can support the welfare of salmon.
- 9) Prioritise the recommendations from the Salmon Symposium, work on them and where appropriate include them in the Salmon Management Plan.
- 10) Look at any gaps in the science relating to salmon and on a needs basis recommend the studies required. (Make the best use of the scientists who can contribute to the fishery)
- 11) Investigate and promote ways to fund the work on the salmon fishery. Where appropriate this funding to be accounted for through New Zealand Fish and Game)
- 12) The Committee and indeed Fish and Game accepts that there are other stakeholders who financially and in some cases voluntarily contribute towards the welfare of the sea run salmon fishery. The National Salmon Committee will support the work of these stakeholders. (Other than where this is not deemed to be prudent)
- 13) Complete a budget for the work of the committee and have this approved by the New Zealand Council. (Note – no expense can be incurred by the committee without the approval of the New Zealand Fish and Game Council unless covered elsewhere within the budgetary processes used by Fish and Game.)
- 14) Report on activities primarily to the New Zealand Council but also to Regional Councils and those parties who form the membership of the committee.
- 15) Recommend to the New Zealand Fish and Game Council and changes to the terms of reference of the Committee that the committee believes will improve its functioning.

Taranaki Fish & Game Council

Fish Licence Sales report to 31 January 2018

2016 - 2017 Channel	FWF	FWA	FWNA	FSLA	FLAA	FWJ	FLBA	FSBA	FDA	FDJ	Total	Fish LEQ	Total Value
Agency Online	60	248	22	36	9	19	0	17	60	5	476		
Eyede Call Centre	0	1	0	0	0	2	0	1	0	0	4		
Public Online	53	136	19	8	10	13	2	12	66	10	329		
Retail Book	9	27	0	0	0	4	0	0	7	7	54		
Total	122	412	41	44	19	38	2	30	133	22	863	706.57	\$89,879.00

2017 - 2018 Channel	FWF	FWA	FWNA	FSLA	FLAA	FWJ	FLBA	FSBA	FDA	FDJ	Total	Fish LEQ	Total Value
Agency Online	60	259	19	43	9	34	2	23	54	11	514		
Eyede Call Centre	0	0	0	1	0	0	0	0	0	0	1		
Public Online	52	166	28	10	13	24	2	12	80	3	390		
Retail Book	4	16	0	0	0	3	0	0	0	0	23		
Total	116	441	47	54	22	61	4	35	134	14	928	751.44	\$97,219.00

Differences	-6	29	6	10	3	23	2	5	1	-8	65	45	7,340
key											7.54%	6.35%	8.22%
FWF													
FWA													
FWNA													
FSLA													
FLAA													
FWJ													
FLBA													
FSBA													
FDA													
FDJ													
National Sales													
	Total										Fish LEQ	Total Value	
	2016 - 2017										79,698	8,186,271	
	2017 - 2018										83,829	8,617,715	
	Difference										4,131	431,444	
											5.19%	3.46%	
												5.27%	

Recommendation: That the Fish Licences sales to 31 January 2018, with comparison to previous year, be received

Taranaki Fish & Game Council
 Budget Report to 31 December 2017
 And
 Project Progress to 31 January 2018

OUTPUT	Budget external costs	YTD external costs (31/12/17)	Comments on significant variations	Budget Hours	YTD hours
Population Monitoring	7,800	564	Banding & aerial count costs still to come	470	105
Harvest Assessment	3,050			50	.25
Hatchery	8,000	2,970		85	13.75
Liberations	5,500	15,896	This includes the Patea releases expenses offset by the income shown on the next page	110	121
Season Regulations				30	18.25
Gamebird Dispersal	1,500	1,307	Includes a new gas gun	120	48.75
RMA	100			500	51.75
Habitat Management & Enhancement	15,600	1,796	12.5k committed	400	55.25
Hunter / Angler Access	3,200			100	15.50
Satisfaction Survey	300			10	.25
Magazine / Newsletter / Ezine	6,800	1,458		140	11.5
Other Publications	1,500			30	4.5
Clubs	300	300		10	7.25
Statutory Liaison				30	1
Iwi Liaison				40	6
General Advocacy	3,000			320	51.25
Information to licence holders				-	
Hunting & Angling Promotions	2,000	1,697		30	47
Ranger Management	1,500	484		112	32.25
Compliance				170	17.5
Licensing & Commission	9,785	3,298		80	1.25
Council Meetings & Administration	10,500	6,350		180	42.25
Management, Strategic & Policy					8.5
Business Planning				40	1.5
OSH & Other Reporting	7,200	5,735		55	4.25
National Liaison	100			160	8.25
Total Expenditure	87,735	41,855		3,312	463.5

	Budget Income	YTD Income
Project Income		
Harvest Assessment	500	-
Liberations	2,000	12,180 This includes Patea money from trustpower
Gamebird Dispersal	500	400
Compliance		-
Total Income	3,000	12,580
Net Expenditure	84,735	29,275

	Budget	YTD
Overheads		
1910 Salaries & Management Contract	234,623	61,450
1920 Staff Expenses	2,700	797
1940 Office Premises	19,759	8,412
1950 Office Equipment	3,000	275
1960 Communications / Consumables	9,575	3,009
1970 General	2,350	2,930
1980 General Equipment	800	287
1990 Vehicles	16,200	7,107
Total Overheads	275,007	84,267

	Budget	YTD
Other Income & Expenses		
Interest	15,848	6,755
Wellington Fish & Game Admin	7,000	3,205
Donation		62
Total Other Income & Expenses	22,848	10,022

	Budget	YTD
Nett Project, Overhead and Other Expenditure/Income	336,894	103,520 (31%)

SPECIES MANAGEMENT

2017/2018 Annual Plan – Planned Result	Progress to date
<p><u>Fish Population assessment</u></p> <p>1. Report to Council detailing the status of the sports fish population and implications for management by 31 August 2018.</p> <p>2. Baseline trout population information obtained and reported for the Manganuioteao River (year 2 of 2).</p> <p>3. Opportunities to enhance the Timaru Stream fishery investigated and reported to Council</p>	<p><i>Taranaki trout spawning survey data was provided to Wellington F&G for modelling purposes.</i></p> <p><i>Developed plan and carried out 4-6 December 2017 electric fishing survey of the Manganuioteao River catchment.</i></p>
<p><u>Gamebird population Assessment</u></p> <p>1. Presentation to the Council detailing population status and implications for management of the region's black swan and paradise shelduck populations. The report to be presented to Council at its first planned meeting in 2018.</p> <p>2. Study initiated into the movements of mallards between the Taranaki high country and coastal regions and the implications for long-term monitoring programme.</p> <p>3. Mallard monitoring protocol based around banding in the Waimarino Region and aerial counts on the Taranaki ring plain implemented and the second year's results reported to Council</p> <p>4. Pukeko Counts conducted in April and shoveler duck counts in August. Analysis presented to Council by 31st December 2017 as part of the Draft Game Gazette notice.</p>	<p><i>January 2018 trend counts were carried out for paradise shelduck & black swan and a report prepared for Council's 10th February 2018 meeting.</i></p> <p><i>Finalised 2017 band return details</i></p> <p><i>Manager obtained L2 certification. 2018 banding site approvals gained.</i></p> <p><i>Agenda item prepared for December 2017 meeting.</i></p>
<p><u>National Hunter Survey</u></p> <p>1. Full participation in Fish & Game New Zealand's national hunter harvest survey during the 2018 game season, and including recording of banded birds shot.</p> <p>2. Hunter survey results for 2017 game season included in analysis presented to Council by 31st December 2017 as part of draft Game Gazette Notice.</p>	<p><i>Results included in agenda item prepared for December 2017 meeting.</i></p>
<p><u>Special Gamebird Season</u></p> <p>1. The co-ordination of a 2-weekend special game bird hunting season for paradise shelduck in Area C.</p> <p>2. Presentation to Council by 31 August 2018 of the results of the 2018 Special Game Bird Season.</p>	

<p>3. When appropriate promote the use of recreational hunter to landowners with paradise duck problems.</p>	
<p>Hatchery</p> <p>1. To have reared 3,000 healthy trout (fingerling, yearling and two year old) consistent with identified needs at the Hawera hatchery</p> <p>2. Trial rearing 300 2-year old trout for Stratford Fishing Day.</p> <p>3. Complete review of hatchery requirements and options to meet these and report to Council.</p>	<p><i>While there was a good hatch of the 3,500 rainbow ova received in July 2017, a faulty tap on one of the fry troughs resulted in approx. one third of the fry dying on 20.10.2017. On 27.10.2017 the hatchery team leader noticed that boards on the dam spillway were failing, but quick remedial action by Silver Fern Farms prevented any loss of water supply to the hatchery.</i></p> <p><i>The largest 290 rainbow trout were separated out (09.10.2017 & 19.10.2017) to maximise their growth for the Stratford Fishing Day.</i></p>
<p>Trout Liberations</p> <p>1. Release of 3,000 healthy trout into lakes and rivers where the species already exists and release is appropriate, these releases reported to Council by 31 August 2018.</p> <p>2. Release of up to 900 healthy two year old rainbow trout into approved waters to provide immediate angling opportunity.</p> <p>3. Complete year 3 year study into the value of stocking specific streams and report to Council with recommendations.</p>	<p><i>Rainbow trout yearlings were released into Lakes Mangamahoe (100) and Rotomanu (50) on 20.09.2017. The Stony River received a release of 65 rainbow yearlings on 14.11.2017. Namunamu release completed 19.10.2017 after delays due to wet weather. Trustpower funded the release of 1,000 tagged yearling brown trout and 500 tagged yearling rainbow trout into the lower Patea River on 02.11.2017, with liberation report produced for Trustpower. A total of 290 17-month rainbow trout were successfully transferred from the Hawera hatchery to the Stratford scout den pool (Patea River) on 08.12.2017</i></p> <p><i>500 2-year rainbows from the Eastern Region were liberated into Lake Rotomanu (250) and Opunake Lake (250) on 17.10.2017 for kids' trout fishing events.</i></p> <p><i>Year 3 diaries were prepared and distributed to participating anglers. Provided Cawthron with recent release information as part of National review of stocking practices. Followed up on Councillor Karalus's initial contact re. stocking Hawera pond.</i></p>
<p>Keep & Release Approvals</p> <p>1. Provision of advice as required on proposals to keep, rear or release game birds and to keep of</p>	<p><i>An inquiry was received regarding the release of brown trout into a private lake</i></p>

<p>release sports fish. Recommendations made to DOC on the issue of such permits.</p> <p>2. Liaison with F&G National Office regarding streamlining the process for application and approval to rear and release gamebirds.</p>	<p>(11.09.2017).</p> <p><i>Prepared agenda paper on captive reared mallards for February 2018 meeting.</i></p>
<p><u>Season Regulations</u></p> <p>1. Draft recommendations and supporting information regarding the 2018 gamebird hunting conditions and 2019 Special Season conditions provided to Council for the December 2017 meeting.</p> <p>2. Council's recommendations for 2018 game bird hunting season conditions are accurately incorporated into the 2018 Game Gazette Notice and supporting information.</p> <p>3. Recommendations and supporting information regarding the 2018/19 sports fishing conditions provided to Council for the June 2018 meeting.</p> <p>4. Council's recommendations for 2018/2019 sports fishing conditions are accurately incorporated into the 2018 Anglers' Notice and supporting information</p>	<p><i>Agenda paper prepared for December 2017 and February 2018 meetings</i></p> <p><i>Reviewed draft gazette notice and 2018 game booklet</i></p>
<p><u>Gamebird Dispersal</u></p> <p>1. Proactively assist with the dispersal of unwanted congregations of game birds that are notified to the Council throughout the year</p>	<p><i>To date, 33 permits have been issued;</i> <i>17 include Pukeko</i> <i>14 include Paradise Shelduck</i> <i>8 include Mallard.</i> <i>21 Rural</i> <i>12 Urban</i></p> <p><i>Information was provided to members of the public about dispersing mallard ducks (18.09.2017) and rock pigeons.</i> <i>Advice provided to stock feed company re managing problem aggregations of mallards</i></p> <p><i>Placed ad in NZ Dairy newspaper re contacting F&G for help</i></p>

HABITAT PROTECTION & MANAGEMENT

<p><u>Resource Management Act</u></p> <p>1. Make effective submissions on resource consent applications and statutory plan proposals to best achieve sports fish and game bird habitat protection and enhancement and / or to maintain or enhance hunting or angling access and opportunity.</p>	<p><i>TRC Officers Reports for the Fonterra Whareroa water take and sediment discharge consent renewals were reviewed and final signoff given (03.10.2017).</i> <i>There was liaison with STDC regarding a resource consent application for a quarry adjacent to Okahu Stream. The application</i></p>
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was judged to be inadequate and returned to the supplicant (01.09.2017)

Non-notified approval was given for a change to consent conditions for Civil Quarries Everett Road quarry to allow an increase in the rate of storm water discharge following events that resulted in more than 7.5mm of rain in 30 minutes (24.10.2017).

Non-notified approval was given (14.12.2017) to DH Lepper Trust for removal of the 100gm⁻³ suspended solids condition from a piggery treated wastewater discharge consent to Waiongana River during high flow conditions.

Pre-application discussions with consultants were held regarding:

- *STDC water takes from Otakeho Stream & Waingongoro River (written comments provided 17&18 January 2018);*
- *Pastoral irrigation takes from Punehu, Ouri and Taungatara Streams (written comments provided 17.01.2018);*
- *A pastoral irrigation take from Oeo Stream (18.12.2017).*
- *Renewal of consent for the Fire Training Centre at Maui Production Station to discharge treated storm water to Oaonui Stream.*

There was discussion with the TRC regarding Council's submission to the Proposed Regional Pest Management Plan and Biosecurity Strategy (22.09.2017).

The NPDC weir on Mangorei Stream was visited (07.11.2017) and a recommendation made that it should be removed.

A site visit was made with Downer & TRC staff to view flood damage to the SH3 Kent Road and Mangamahoe Stream culverts and sedimentation of the head of Lake Mangamahoe (01.09.2017).

Trustpower's upper catchment 6-year monitoring and Patea dam trap & transfer reports were reviewed (11.10.2017) and it was recommended that upper catchment monitoring be repeated in another 6 years.

A TrustPower Patea HEPS stakeholder meeting was attended (16.12.2017).

There was liaison with TRC staff regarding identification of farm culverts that restrict fish passage, so that remedial action can be undertaken.

<p>2. Engage in and actively advocate for protection and/or enhancement of sports fish and gamebird habitat in the Taranaki Freshwater Plan Review process.</p> <p>3. Complete strategic review of how Council best engages in RMA processes to achieve habitat and wider outcomes with available resources.</p>	<p><i>A meeting with Office of the Auditor General staff was attended (along with Fed Farmers & NPDC & SDC reps.) to provide feedback on progress the TRC has made since 2011 in managing impacts on freshwater quality (15.11.2017).</i></p> <p><i>A meeting was attended with STDC, Nga Rauru & DOC (25.01.2018) to discuss the MOU for the Waverley Wastewater Working Party.</i></p> <p><i>A site visit was made (12.12.2017) to inspect shot-creting remedial works being undertaken to the Stony River SH45 Bridge abutments. Dirty water being pumped from inside the TRB bund directly into the river was reported to TRC and the discharge was subsequently diverted to land (as the 2014 application for consent stated that it would be).</i></p> <p><i>Provided advice to landowner re concerns over stream piping at Raurimu.</i></p> <p><i>Provided comments on draft F&G position on NPS freshwater</i></p>
<p><u>Sports Fish Habitat Enhancement</u></p> <p>1. Provision of advice and promotion of effective management of riparian land margins throughout the region.</p> <p>2. Take opportunities to advocate for maintenance of flows to protect fishery values in recognised trout streams.</p> <p>3. Undertake and assist with efforts to keep Didymo and other aquatic threats out of the Taranaki Fish & Game Region.</p>	<p><i>Inspected properties and gave advice to two landowners outside the region.</i></p> <p><i>Met with Horizons R.C to discuss Orautoha Stream monitoring and sediment management</i></p> <p><i>Liaised with the TRC summer CCD advocate and organised their attendance at the Stratford kids' trout fishing day.</i></p>
<p><u>Gamebird Habitat Enhancement</u></p> <p>1. Provision of advice to licence holders and landholders regarding the enhancement of game bird habitat and predator control.</p>	<p><i>Liaised with hunter who is producing duck hen houses for sale with 50% of profits going to the GBHTB. Visited (12.12.2017) & provided advice on replacing a leaky outlet structure on a QEII wetland in the Mangorei area. Made site visits to 2 wetland projects in the Toko & Tututawa areas (21.12.2017)</i></p> <p><i>Met with Whanganui landowner re potential</i></p>

<p>2. Provision of information and advice to applicants for GBHTB grants. Act where necessary as referees for projects and monitor the implementation of successful applicants to ensure works are carried out to the agreed standard.</p> <p>3. Promote the need for and provide advice regarding predator control programmes and any other outcomes from the Mallard Research project.</p> <p>4. Explore options for a wider Nukumarū conservation area involving the respective landowners and agencies.</p>	<p><i>predator control and habitat management project in association with Horizons R.C</i></p> <p><i>The Hayward wetland owners have carried out most of the agreed works, but decided not to uplift their GBHTB grant.</i></p> <p><i>Undertook trial to identify predators around a wetland complex using game cameras</i></p>
<p><u>Hunting & Habitat Scheme</u></p> <p>1. Actively promote the Hunting & Habitat Scheme to regional licence holders and landowners including through site visits, regional newspapers, newsletters and other media.</p> <p>2. Provide support for applications to H&HS including advice on design and construction and on-site assistance to create high quality wetlands and hunting opportunities.</p> <p>3. Identify and actively pursue suitable opportunities for development of council owned wetlands.</p>	

PARTICIPATION AND SATISFACTION OF ANGLERS AND HUNTERS

<p><u>Angler Access</u></p> <p>1. Resolution of how best to provide access information to licence holders.</p> <p>2. Production of updated Waimarino access pamphlet.</p> <p>3. Production of an updated Taranaki Ringplain brochure to reflect the new regulations (year 1 of 2)</p> <p>4. Implement any identified opportunities for increased angling access around Lake Mangamahoe and design and erect angling information signs that are consistent with the signs policy.</p> <p>5. Replace / erect new signs consistent with priorities and needs identified in 2017.</p>	<p><i>Approval obtained from Trustpower (10.10.2017) and NPDC (30.10.2017) to construct an additional casting platform at Lake Mangamahoe. Confirmed (25.10.2017) that the structure would meet the permitted activity requirements of the TRC's Freshwater Plan (Rule 61).</i></p> <p><i>Angler regulation signs removed from Kapuni & Kaiuau Streams (19.10.2017). Designed</i></p>
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<p>6. Liaison with the Walking Access Commission to identify potential improvements in public access.</p>	<p><i>draft sign for Trustpower re Patea trout release trial</i></p> <p><i>Met with Walking Access representative along with representative of potential owner of several forests re game bird hunting access</i></p>
<p><u>Hunter Access / Opportunities</u></p> <p>1. Negotiate, allocate and issue access permits to publicly available hunting areas for the 2018 game bird season.</p> <p>2. Actively seek and develop opportunities for gamebird hunter access.</p> <p>3. Refine mentoring programme for new or young shooters utilising Hawkens Wetland and any other identified opportunities.</p> <p>4. Review criteria / policy to rear and release upland game and provide recommendations to Council.</p>	<p><i>Provided recommendation to DOC for the renewal of permits for 3 hunters to hunt in the Looney's Lake Conservation Covenant (16.01.2018).</i></p> <p><i>Met with potential forest owner re access opportunities.</i></p>
<p><u>Licence Holder satisfaction Survey</u></p> <p>1. Implement a survey of angler success and satisfaction for key fisheries in the region as identified in 2014/2015 National Angler Survey or by other needs.</p> <p>2. Survey and report to Council on the aspirations of Upland Gamebird hunters</p>	<p><i>Diary scheme implemented for major rivers and lakes around the region</i></p>
<p><u>Fish & Game Magazine</u></p> <p>1. Provide a regional supplement in each of the two special editions of fish & Game Magazine to be published during the reporting year.</p>	<p><i>2-page supplement prepared for the 2018 game special issue.</i></p>
<p><u>Regional Newsletter</u></p> <p>1. Publication of a Hunting and a Fishing Newsletter for regional licence holders and hunting landowners.</p>	<p><i>Regional fishing newsletter articles prepared and newsletter posted to licence holders on 13th December 2017.</i></p>
<p><u>Regional Fish & Game Web Site</u></p> <p>1. Publication of information, material and articles of interest to hunters and anglers on the regional pages of the Fish & Game web site. Update of existing pages when new platform is available and thereafter information is regularly updated and easy to find and read.</p> <p>2. Develop local facebook page or in association with National Office.</p>	<p><i>An article promoting the Rotomanu & Opunake Lake kids' trout fishing days was added to the website on 11.10.2017. Lake Namunamu information updated. Links to local angling information resolved so it is easier to find.</i></p>

<p>2. The production of at least 6 Reel Life articles and 2 Both Barrels articles.</p>	<p><i>Reel Life articles produced on 25.09.2017, 20.10.2017, 17.11.2017, 19.12.2-17 & 24.01.2018..</i></p>
<p>Club Visits 1. Council representation at recreational hunting and fishing club meetings across the region.</p>	<p><i>Staff attended 3 meetings of the Inglewood, Rod, Gun & Recreation Club (19.09.2017; trout weigh-in 01.10.2017; "big – 4" weigh-in 23.10.2017).</i></p>

PUBLIC INTERFACE

<p>Liaison 1. Liaison with Department of Conservation and Conservation Boards and where appropriate attend Conservation Board meetings within the Taranaki Fish & Game Region. 2. Where possible proactively engage and work co-operatively with Regional and District Councils, other organisations and groups and the rural community.</p>	<p><i>There was liaison with DOC regarding the NPDC's Mangorei Stream weir (07.11.2017).</i></p> <p><i>Attended meeting of Nga ora o te Whangaheu</i></p>
<p>Iwi Liaison 1. Proactively engage and work with Iwi within the region on matters of mutual interest, concern and benefit.</p>	<p><i>There was liaison with Te Atiawa (Sera Gibson) regarding Civil Quarries consenting. There was liaison with Te Korowai o Ngaruahine Trust (Louise Tester) and Te Kahui o Taranaki Iwi (Puna Wano-Bryant) regarding irrigation consents for the Taungatara, Pūnehu & Ouri Streams (22.01.2018).</i></p> <p><i>The Chairman and/or staff were invited to the Taranaki Maunga signing at Parliament on 20.12.2017, but unfortunately were unable to attend.</i></p>
<p>Advocacy 1. Promote the protection of freshwater, wetland and upland game habitats and the wider benefits of this. 2. Represent the interests of anglers and hunters, and promote the validity of fishing and gamebird hunting.</p>	<p><i>The SFO attended 4 meetings of the Taranaki Biodiversity Trust (WfT) including the AGM and Restore Taranaki workshop. The SFO has retired from the WfT Board by rotation and did not seek re-election.</i></p> <p><i>A talk on freshwater sports fishing and environmental protection was given to the Westown Scout Group (15.11.2017).</i></p> <p><i>Staff & the Chairman attended the TRC Environmental Awards (09.11.2017) where the SFO was awarded Action in the Community Award.</i></p>

<p><u>Information to licence holders including hunting & angling promotions</u></p> <p>1. Support trout fishing events, using liberations of 2 year old rainbow trout, to encourage participation and family involvement.</p> <p>2. Production of Regional Stillwater Sports Fisheries pamphlet with an emphasis on perch (year 2 of 2)</p> <p>3. Develop displays that promote local fishing and hunting opportunities in association with National Office.</p>	<p><i>Kids' trout fishing events were held at Lake Rotomanu (120 kids) and Opunake Lake (70 kids) on 28.10.2017 and at the Stratford scout den pool on the Patea River (09.12.2017). A TET funding application for the Stratford kids' trout fishing event was successful.</i></p>
<p>1. Production of pamphlet "Introduction to Pheasant Hunting in the Taranaki Region".</p> <p>2. Provide timely and useful information to licence holders when requested. Proactively utilise opportunities such as newspapers, website and public events to make information available.</p> <p>3. Opportunities for publicity on angling and hunting are taken and copies of coverage reported to Council.</p>	<p><i>Written & verbal information was provided to licence holders on request Information provided to Andy Tannock to assist his article in H&F catalogue.</i></p> <p><i>2017 fish season opening articles were provided to the North Taranaki Midweek, Stratford Press, South Taranaki Star, Opunake & Coastal News, Taranaki Daily News and Ruapehu Bulletin. Kids' fishing day articles were provided to 3 newspapers and promoted via More FM and the Taranaki Hunting & Fishing facebook page. There was liaison with the Daily News regarding the TRC 2017 Environmental Awards. Articles were provided to the Stratford Press (3), South Taranaki Star (2) & Daily News for the Stratford kids' trout fishing event. There was very good post event coverage in the Stratford Press & South Taranaki Star. Information was provided to the Daily News for an article on low stream flows in Taranaki (29.12.2017). Article produced for summer holiday issue of Ruapehu Bulletin. Filmed clip on correctly handling trout for Pure Fly tv programme.</i></p>

COMPLIANCE

<p><u>Ranger Management and Training</u></p> <p>1. The recruitment, training and skill maintenance of Council's Honorary ranger team is consistent with the Compliance Policy and Strategy.</p>	<p><i>Two new warrants issued and two other initial warrants renewed.</i></p>
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<p>2. Provision of safety and compliance training and maintenance of compliance skills is provided on at least two occasions during the year.</p> <p>3. Comprehensive report detailing compliance activities including ranger management and results over the year presented to Council by 31 August 2018.</p>	<p><i>A 1-day Ranger training refresher was held on 09.09.2017, attended by 10 Rangers & 2 staff.</i></p>
<p>Compliance</p> <p>1. Compliance checks and any prosecutions are completed consistent with the Compliance Policy and strategy and also the Reparation Policy.</p>	<p><i>Ranging was organised for the opening of the 2017 trout season and following kids' trout fishing events. Ranging also undertaken over Labour Weekend and Xmas holidays</i></p>

LICENCING AND AGENTS

<p>Licences</p> <p>1. Hunters and anglers are aware of and can quickly and easily buy their licences on line.</p> <p>2. Progress reporting on licence sales provided to Council throughout the year.</p>	
<p>Licence Agents</p> <p>1. Successfully manage the transition to on-line sales through provision of ready support and assistance to agents.</p> <p>2. An effective solution is in place that allows hunters to easily buy licences where on-line facilities are not available.</p> <p>3. Agents are fully aware of and are familiar with the new licence categories and able to appropriately advise the buyer.</p>	<p><i>New owners of Magnum Sports set up to make on-line licence sales and familiarised with licence categories available.</i></p>

COUNCIL

<p>1. Not less than six meetings of the Council that comply with all legal requirements to be held before 31 August 2018.</p> <p>2. Council Elections are conducted in an effective, appropriate and timely manner and the new Council provided with familiarisation and governance training as required.</p>	<p><i>Staff attended Council meetings on 14.10.2017 & 02.12.2017.</i></p>
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PLANNING AND REPORTING

<p>Management Planning</p> <p>1. Regional policies are developed and adopted when required.</p> <p>2. The 5 year strategic plan is reviewed and agreed by Council by March 2018.</p>	<p><i>Agenda item for February 18 meeting</i></p>
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<p>Staff Management</p> <p>1. Effective management of staff and administration of Council.</p>	<p><i>Staff performance reviews completed.</i></p>
<p>Administrative Support</p> <p>1. Implement review outcomes re computing requirements including file storage sharing.</p> <p>2. Implement any outcomes of National Council financial review.</p>	
<p>Annual Planning</p> <p>1. Adoption of a proposed Annual Budget and Operational Work Plan for 2018/2019 by the Council by 31 August 2018.</p>	
<p>Annual Reporting</p> <p>The adoption and presentation by the Council at a public annual general meeting of its audited annual report for 2016/2017 not later than 31 December 2017, and dispatched to the Minister directly thereafter.</p>	<p><i>Finalised 2016/17 accounts and completed draft Performance Report. 2017/18 Performance report adopted by Council at its AGM 2.12.17, dispatched to the Minister 5.12.17.</i></p>
<p>Regional and National Liaison</p> <p>1. Discussion undertaken with Wellington and Auckland/Waikato Fish & Game regions re consistency with gamebird regulations.</p> <p>2. Effective communication with other regional managers and input and valued comment on issues affecting Fish & Game and sports fish and game bird management.</p>	<p><i>Liaison with Wellington and Northland regions over mag extensions and paradise Special season regulations.</i></p> <p><i>Liaison with National CLE co-ordinator over training</i></p>
<p>1. Representation to New Zealand Fish and Game Council by 31 August 2018, of the Council's recommendations for licence fees, fund redistribution, research requirements, and national policy development.</p> <p>2. Representation at the Fish & Game New Zealand Regional Managers meetings.</p> <p>3. Effective communications with NZC staff and comment provided on Fish & Game issues when requested.</p>	<p><i>National CRMs and Salmon Committee agenda papers prepared for February 18 meeting</i></p> <p><i>Provided comment re camouflaged boat regulations and also possible changes to the Gamebird regulation booklet</i></p>

STAFF CO-ORDINATION AND TRAINING

<p>Staff Communication</p> <p>Regular staff meetings and/or phone conferences to share information such that all staff are aware of what is generally occurring, and where appropriate have ready opportunity for input into decisions and management direction.</p>	
<p>Staff Training</p> <p>Staff training identified in performance review process is planned and undertaken.</p>	<p><i>The SFO attended a 4-day NZ Freshwater Sciences Society conference in Hamilton (20-</i></p>

<p>Accommodation Review of options for New Plymouth and Whanganui offices are completed and decision made by Council as to best solution for the medium term.</p>	<p>23 November 2017).</p> <p><i>Decision to shift the New Plymouth office made by Council on 14.10.2017. Agreement to Lease agreed and Exceptional Funding bid prepared & accepted. Office shift completed on 31.01.2018.</i></p> <p><i>Renewal of Whanganui office lease completed</i></p>
<p>OSH</p> <ol style="list-style-type: none"> 1. All processes and activities are consistent with Council Health & Safety Policy and hazard control plans, reviews and audits occur as scheduled, all necessary equipment and training is provided and new hazards are identified and addressed appropriately. 2. All accidents are reported and recorded in the accident register, investigations completed and any identified actions implemented and reported to Council at the next meeting 3. Hazard Control Plans are identified and developed / amended for any new activity. 4. An annual review of Health and Safety Management is completed in September 2017 and reported to Council. 5. Compliance with HSAW requirements and policy and any issues identified are reported to each meeting of Council. 6. Two monthly staff meetings which include a specific agenda item to discuss HSAW are held. 7. Staff are actively involved in implementing HSAW policy and ensuring safe workplace. 	<p><i>Reported in separate agenda paper</i></p> <p><i>Reported to October 2017 Council meeting</i></p> <p><i>Staff meetings held on 28.09.2017, 17.11.2017 & 31.1.2018</i></p>

Recommendation

That the Budget Report to 31 December 2017 and Project Progress Report to 31 January 2018 be received.

TARANAKI FISH AND GAME COUNCIL

The Chairman
Taranaki Fish and Game Council

Financial Reports to 31st December 2017

Please find attached the following reports YTD Balance Sheet and YTD Profit & Loss

1. Profit & Loss 1 September 2017 to 31 December 2017
2. Balance Sheet 1 September 2017 to 31 December 2017

RECOMMENDATION

That Profit & Loss and Balance Sheet to 31 December 2017, be received.

Jilli Steedman
SECRETARY
1 February 2018

Profit & Loss

Taranaki Fish and Game Council

1 September 2017 to 31 December 2017

31 Dec 17

Income

3000 - Licence Sales	\$82,179.17
4315 - Gas Gun Rental	\$400.00
4354 - Kid's Fishing Days	\$1,179.96
4910 - Contracts	\$3,205.09
4971 - Interest Income	\$6,755.39
4974 - Grants Received	\$43,830.00
Total Income	\$137,549.61

Gross Profit

\$137,549.61

Plus Other Income

4355 - Liberations - Other	\$11,000.00
4972 - Donations	\$62.00
Total Other Income	\$11,062.00

Less Operating Expenses

1111 - Fish Population Monitoring	\$137.31
1112 - Gamebird Population Monitoring	\$426.66
1141 - Hatchery	\$2,969.80
1161 - Kids Fishing Days	\$5,089.38
1162 - Other Liberations	\$10,806.69
1181 - Gamebird Dispersal	\$1,307.40
1231 - Sports Fish Habitat Management & Enhancement	\$1,510.00
1232 - Gamebird Habitat Management & Enhancement	\$285.92
1333 - Regional Newsletter	\$1,458.00
1361 - Clubs	\$300.00
1432 - Hunting & Angling Promotions	\$995.90
1441 - Angling promotions	\$701.13
1521 - Ranger Training	\$100.00
1522 - Ranger Catering & Travel	\$384.37
1621 - Licence Agents	\$576.15
1631 - Commission on Sales	\$2,722.00
1721 - Council Meeting Expenses	\$6,350.50
1831 - Other Reporting / OSH	\$115.54
1833 - Audit	\$5,620.00
1911 - Salaries	\$61,449.29
1921 - ACC Levy	\$152.20
1923 - Staff Training	\$582.61
1925 - Staff Expenses	\$61.85

1942 - Office Premises Rent	\$8,371.13
1945 - Power Administration Building	\$41.57
1953 - Equipment Maintenance	\$275.11
1961 - Telephone/fax	\$2,148.29
1962 - Postage	\$574.70
1964 - Stationery	\$268.84
1965 - Photocopying	\$17.40
1972 - Subscriptions	\$234.83
1974 - Bank Charges	\$45.00
1975 - Office General (was Petty cash)	\$53.82
1976 - Insurance - General	\$2,596.48
1981 - Field Equip -Purchases (Under \$2,000)	\$183.50
1983 - Field Equipment Maintenance	\$103.48
1990 - Vehicles & Trailers	\$7,106.80
Total Operating Expenses	\$126,123.65
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Net Profit	\$22,487.96
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Balance Sheet
Taranaki Fish and Game Council
As at 31 December 2017

Assets

Bank

BNZ Current Account	\$44,572.71
BNZ Term 3031	\$421,626.21
MRP	\$23,547.24
Total Bank	\$489,746.16

Current Assets

Accounts Receivable	\$25,344.06
Prepayments and Accrued Income	\$6,342.56
Total Current Assets	\$31,686.62

Fixed Assets

Accum Dep Vehicles	-\$36,119.56
Accum Dep Buildings	-\$26,314.40
Accum Dep Office Equipment	-\$16,551.42
Accum Dep Plant & Equipment	-\$11,532.07
Buildings	\$30,681.00
Office Equipment	\$23,328.00
Plant & Equipment	\$21,059.00
Vehicles	\$104,109.29
Total Fixed Assets	\$88,659.84

Total Assets	\$610,092.62
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Liabilities

Current Liabilities

Accounts Payable	\$18,798.16
Accruals and Prepaid Licences	\$6,463.00
BNZ Credit Card - Allen	\$123.81
BNZ Credit Card - Glenn M	\$1,357.22
GST	\$4,433.70
Rounding	-\$0.01
Total Current Liabilities	\$31,175.88

Total Liabilities	\$31,175.88
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Net Assets	\$578,916.74
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Equity	
Accumulated Funds	\$116,716.28
Asset Replacement Funding	\$16,744.00
Back Country Fisheries Reserve	\$3,992.00
Current Year Earnings	\$22,486.96
Fisheries Project	\$17,396.30
Hunting & Habitat Scheme	\$381,106.22
Manganuioteao River Riparian Project	\$20,474.98
Total Equity	\$578,916.74

TARANAKI FISH AND GAME COUNCIL

The Chairman
Taranaki Fish and Game Council

Correspondence Schedules

Please find attached Inwards and Outwards correspondence schedules to 31st January 2018.

RECOMMENDATION

That Inwards and Outwards correspondence schedules to, 31st January 2018 as shown on pages & , be received.

Jilli Steedman
SECRETARY
1st February 2018

INWARDS CORRESPONDENCE

Corr No	Date	Meeting	FROM	FILE NO	Staff/Councillor	SUBJECT
1	28.11.17	Feb-18	Pihama Farms	2.3.5	Allen	Resource consent renewal
2	28.11.17	Feb-18	BTW Company	2.3.5	Allen	Renewal of consent for Fire Training Centre at Maui Production Station
3	30.11.17	Feb-18	BTW Company	2.3.5	Allen	AEE & TRC monitoring Report for Fire Training Centre
4	5.12.17	Feb-18	DH Lepper Trust	2.3.5	Allen	Condition 18 removed from consent
5	7.12.17	Feb-18	Chris Fern Trustpower	Patea HEPS	Glenn	Patea trout release
6	7.12.17	Feb-18	Chris Fern Trustpower	Patea HEPS	Glenn Allen	Patea HEPS annual stakeholder meeting
7	11.12.17	Feb-18	Robert Sowman	3.2.2	Glenn	2018 Draft Gazette Game Season
8	14.12.17	Feb-18	Robert Sowman	3.1.2	Staff	Licence & Magazine Schedule for 2018
9	14.12.17	Feb-18	Robert Sowman	3.7.1	Glenn	Revised 2017 Ranger Manual
10	14.12.17	Feb-18	Eyede	3.6.4	Jilli	Eyede Xmas hours
11	19.12.17	Feb-18	Kristin Aitken OAG	4.6.2	Jilli	Performance Reporting
12	20.12.17	Feb-18	Jeremy Brophy BTW	2.3.5	Allen	Non Notified Approval -Everett Road Quarry. Draft conditions
13	14.1.18	Feb-18	A Chesswas Renaissance Consulting	2.3.7	Allen	Water Permit (Otakeho) - Draft AEE
14	14.1.18	Feb-18	A Chesswas Renaissance Consulting	2.3.7	Allen	Water Permit (Waingongoro) - Draft AEE
15	18.1.18	Feb-18	Meghan Bairrett BTW	2.3.5	Allen	Renewal of consent for Fire Training Centre at Maui Production Station
16	22.1.18	Feb-18	Renewable Power Ltd	2.3.5	Allen	Normanby weir fish pass project
17	31.1.18	Feb-18	Taranaki Regional Council	1.1.7	Glenn Allen	Hatchery inspection notice
18	31.1.18	Feb-18	Wanganui Insurance Brokers	4.6.3	Glenn	Insurance amendment NP Office location

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OUTWARDS CORRESPONDENCE

Corr No	Date	Meeting	TO	FILE NO	Staff/Councillor	SUBJECT
1	30.11.17	Feb-18	S & B Rowlinson	1.2.11	Glenn	Authority to Disturb Gamebirds
2	30.11.17	Feb-18	K & V Bretherton	1.2.11	Allen	Authority to Disturb Gamebirds
3	30.11.17	Feb-18	J Bourke	1.2.11	Allen	Authority to Disturb Gamebirds
4	7.12.17	Feb-18	Robert Sowman	3.2.2	Glenn	Taranaki 2018 Game Gazette Notice
5	8.12.17	Feb-18	D & P Dent	1.2.11	Allen	Authority to Disturb Gamebirds
6	8.12.17	Feb-18	K Downs	1.2.11	Allen	Authority to Disturb Gamebirds
7	11.12.17	Feb-18	Stratford Press	3.1.1	Allen	Kids fishing day article
8	3.12.17	Feb-18	A Greenhill	1.2.11	Allen	Authority to Disturb Gamebirds
9	14.12.17	Feb-18	A Harris	1.2.11	Allen	Authority to Disturb Gamebirds
10	14.12.17	Feb-18	Steve Lepper	2.3.5	Allen	F&G approval for requested change to consent
11	15.12.17	Feb-18	K Young	1.2.11	Allen	Authority to Disturb Gamebirds
12	17.12.17	Feb-18	R Frew	1.2.11	Glenn	Authority to Disturb Gamebirds
13	4.1.18	Feb-18	C Adams	1.2.11	Allen	Authority to Disturb Gamebirds
14	4.1.18	Feb-18	P Roberts	1.2.11	Allen	Authority to Disturb Gamebirds
15	16.1.18	Feb-18	Lisa Bevin DoC	3.4.1	Allen	Hunting permit at Looney's Lake
16	16.1.18	Feb-18	T & L Stanley	1.2.11	Allen	Authority to Disturb Gamebirds
17	17.1.18	Feb-18	Angela Lane	2.3.5	Allen	Draft Water Take AEE's for Review
18	18.1.18	Feb-18	A Chesswas & L Tester	2.3.7	Allen	Water Permit (Otakeho) 3911-2
19	18.1.18	Feb-18	A Chesswas	2.3.7	Allen	Water Permit (Waingongoro) 0213-3
20	22.1.18	Feb-18	K & R Riley	1.2.11	Allen	Authority to Disturb Gamebirds
21	22.1.18	Feb-18	Renewable Power	2.3.5	Allen	Normanby weir fish pass project plan
22	24.1.18	Feb-18	Reel Life	3.1.1	Staff	Reel Life Taranaki January
23	31.1.18	Feb-18	Morikau Station	1.2.11	Glenn	Authority to Disturb Gamebirds (special season)

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